The Journal of Occupational Diseases and Traumatic Surgery

Industrial Medicine

for

Physicians and Surgeons in Industry

Volume 6 FEBRUARY, 1937 Number 2

THIS ISSUE

Tumors of the Bladder
—As Related to Industry—

Trauma
—As a Cause of Malignant Tumor—

Dust Diseases
—and Workmen's Compensation Legislation—

Regional Ileitis
—With Report of Two Cases—

Occupational Diseases
—The Situation, Past, Present and Future—

Cod Liver Oil
—External Use for Ulcers, Wounds, Burns and Skin Lesions—

The Cervical Spine
—Fracture Dislocation—Reduction with Skeletal Traction—

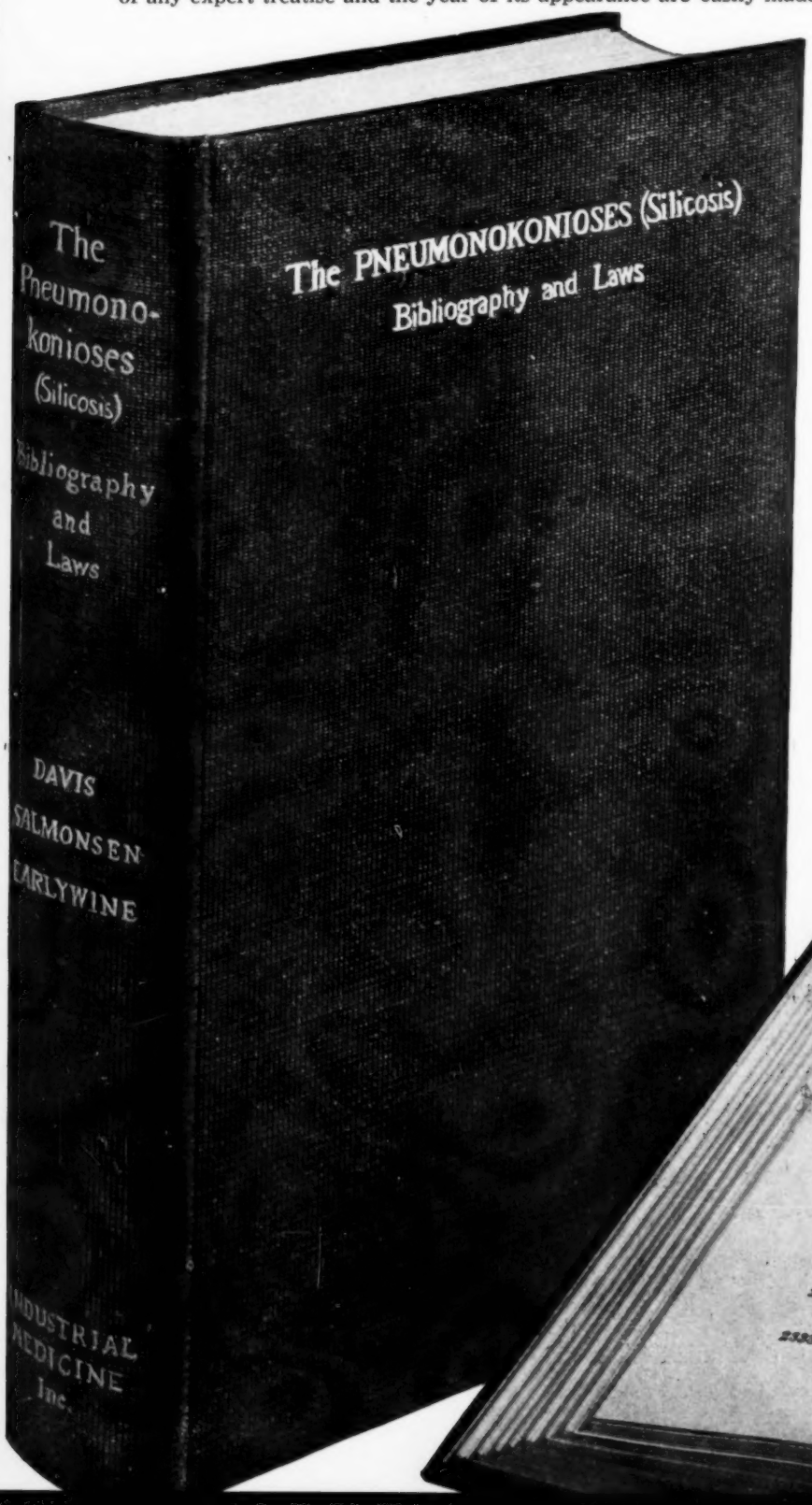
The Hernia Problem
—Some Present-Day Aspects, with Special Reference to the Truss-Injection Method of Treatment—

The Pneumonokonioses (Silicosis)

Bibliography *and* Laws Book No. I

All the References of the World's Literature
--- from 1556 to December 31, 1933 ---

Review from **"Staub"**, (Dust), 1, No. 1:167-168, April, 1936, done by Dr. Ing. O. M. Faber, Berlin.
No. 115. Bibliography and Laws upon Silicosis. **(The Pneumonoconioses (Silicosis) Bibliography and Laws)**, by Geo. G. Davis, E. M. Salmonsen and J. L. Earlywine, published by **Industrial Medicine**, Chicago, Ill., 1934, 482 pp. ($7.50).
The **Forword** is by E. R. Le Count, Chief of the Department of Pathology, The University of Chicago. The book has two main divisions. Part I is a Bibliography of the collected literature of the world upon the **Pneumonoconioses (Silicosis)**. Beginning with the **De Re Metallica** of Agricola (1556), it ends with 1933, inclusive of 2,768 sources, whose title, author and exact citation are given. The works are chronologically arranged. Through subdivision into different groups, the works of authors appearing in the same year are clearly and immediately perceived. Within the groups the works are still arranged in alphabetical sequence by authors. These 276 pages of comprehensive bibliography are followed by a complete **author**—and **subject**—**index**. Besides, the location (orientation) of any expert treatise and the year of its appearance are easily made out at a glance.



In Part II, the Laws of the several States of the Union in North America, as relating to Occupational Diseases, the injuries they cause, and any pertinent material, are all represented. The plan and sub-divisions by which the situation can be ascertained for any one of the 48 states of the United States of America, are readily apprehended. In several cases corresponding paragraphs have cross-references. Especially valuable and complete is this legal survey for ascertaining any characteristic verdict (judgment) in respect of a pneumonoconiosis, showing the basis of the action, the conditions giving rise to the action, as well as the principle involved in the decision—for any state in the Union. The book closes with an alphabetical summary of the enterprises concerned in the juridical distinctions (or decisions.)

Examination of the book compels recognition of the extraordinary care and pains taken by the compilers. Random tests here and there show that for a space of 377 years this bibliography has attained a completeness not hitherto arrived at. Probably no branch of any other science has at its disposal so flawless and richly extensive a bibliography. It is authoritative not only for physicians and industrial experts, but also for physicists, engineers, and employers of industry. The format is entirely appropriate; for the arduous work involved the compilers should receive the fullest recognition.

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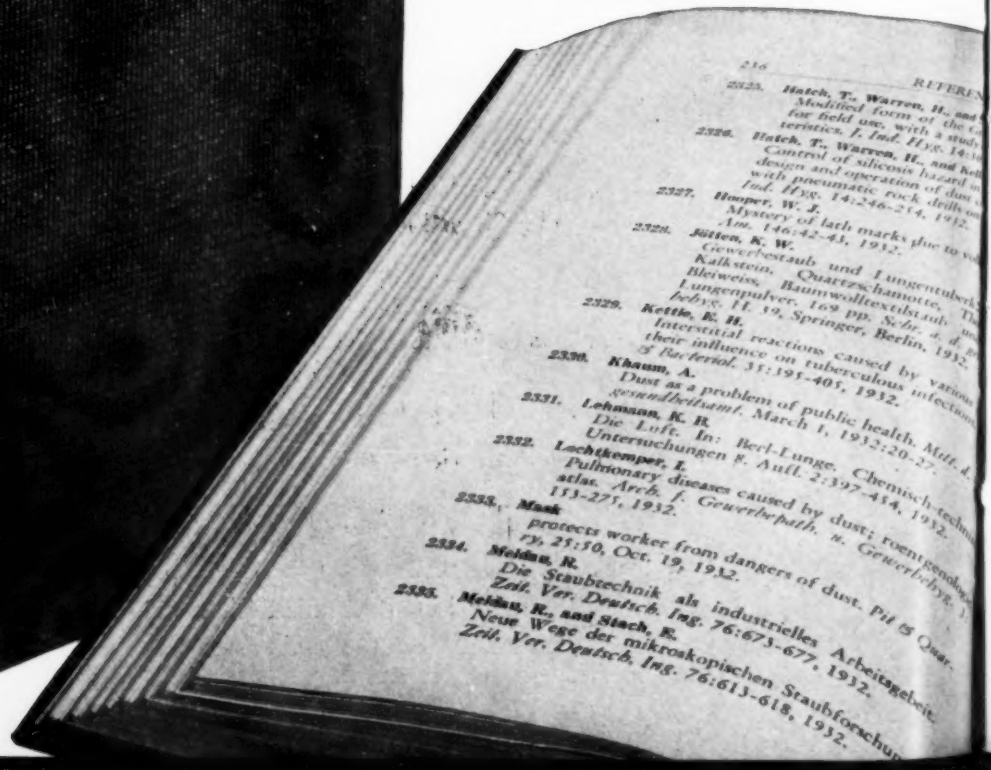

The

Pneumonokonioses (Silicosis) Book No. II

—*Literature and Laws of 1934*—

International Abstracts, Extracts and Reviews of the 1934 Literature of the Pneumonokonioses and Their Allied Diseases and Subjects—Plus the 1934 Bibliography.

Compiled by

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The Wisconsin Medical Journal

BOOK REVIEW

The Pneumonoconioses (Silicosis). Literature and Laws of 1934. By George G. Davis, M.D., Associate Clinical professor of surgery, Rush Medical College, University of Chicago, attending surgeon Cook County Hospital.

A year ago Dr. Davis and his collaborators published Book I which listed, with few exceptions, all the references to pneumonokonioses from 1556 to 1933 inclusive.

The present volume (Book II) furnishes a review of the literature and laws of 1934. Whereas Book I merely cited references, the present work furnishes an abstract of each article. The work is complete. There is a total of 396 references. In addition, the bibliography, not included in Book I, is included. There are good subject and author indexes.

This volume together with Book I will be very valuable to workers in this field. The extensive literature of but one year is indicative of the wide and increasing interest that this subject holds. Compilation of this book has been a worthwhile project. O. O. M.—*Issue November*, 1935.

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OCCUPATIONAL DISEASES
TRAUMATIC, INDUSTRIAL

INDUSTRIAL MEDICINE
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IMPRESSIVE in a growing degree is the quality of the presentations on medical and surgical subjects at recent meetings of the associations of industrial physicians and surgeons. Our January number had six of these in article form; this issue has six more — by DRS. CRUTCHFIELD, STANTON, KNIGHT, HIBBS, DAVIS, and HENDERSON, each on a subject of current interest and importance. There is, in all of these a distinct manifestation of the same kind of "creative activity" as that described by DR. TROSTLER (and evidenced by him in his analysis, p. 101) in connection with the brilliant reasoning of Brandeis and Warren in their study of "The Right of Privacy". Such activity, in whatever form and to whatever extent it may be shown, is the very essence of progress. DR. CRUTCHFIELD'S paper, p. 65, is particularly notable in this respect . . . And DR. JOHNSTON'S "Regional Ileitis" has the same characteristics, in an area where progress is of the utmost importance, considering the very short time —less than a decade—since the condition he describes has been differentiated from cancer . . . The "Hernia Problem" is much discussed, and the injection treatment exhaustively written about. But DR. STANTON brings a fresh point of view and a distinctive style to his paper, making it an important addition to the literature . . . As DR. KNIGHT remarks: "We never know just who will be the next foreign body case" . . . Painstaking study is obvious in ARTHUR HOLMES' excellent summary of the external use of cod liver oil for ulcers, wounds, burns and skin lesions. He presents the subject in a manner as up to date and complete within the limitations of the medical style, as the very excellent note on "Dust Diseases and Workmen's Compensation Legislation" (p. 90) is up to date and complete within the broader facilities of the legal style. How valuable if there were whole libraries of cases in medicine and surgery, as readily accessible — and as completely annotated — as are the cases in law! Just a thought! . . . DR. HIBBS expresses an appreciation of the underlying philosophy of "industrial" medicine when he speaks of the subject matter of his discussion on "Tumors

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of the Bladder", as presenting a problem "which is of great moment economically as well as medically". The economics are the 'raison d'etre' of 'industrial' medicine . . . Dr. SAPPINGTON, in his article says: "I predict that compensation for occupational disease disability will be general in the United States within the next five years — that physical examinations will become universal within the next 10 years, and along with this, will be an increased use of surveys and studies of industrial environment." The economics again: the employer paying for the disability, and then, with reason and common sense, taking the necessary medical precautions so that the aggregate of his expense for disability compensation is no larger than need be. But—as the annotations have it—'cf.' the note on "Dust Diseases": "The only two American acts which recognize the problem of examinations prior to and during employment reflect the conflict—one establishes compulsory examinations under state supervision, the other makes a strongly worded declaration of policy against them." The need for physical examinations, however, as Grover Cleveland once remarked apropos of another matter of timely importance, is: "a condition, not a theory". Something else Dr. Sappington emphasizes should be constantly kept in mind in connection with occupational disease: "a hazard is always an exposure—an exposure is not always a hazard" . . . DR. HERBERT H. DAVIS clears up the question of "Trauma as a Cause of Malignant Cancer", with the trauma a single injury. His conclusion that "trauma reveals more malignant tumors than it causes", is also something to be remembered . . . DR. HENRY F. VAUGHAN, Commissioner of the Department of Health, of Detroit, calls attention to the Mid-West Conference on Occupational Disease, to be held in Detroit, May 3 to 7, in conjunction with meetings of the American Association of Industrial Physicians and Surgeons, and the Michigan Association of Industrial Physicians and Surgeons . . . Our editorial page is persistent in stressing the fact that industrial medicine has an underlying basis as broad and deep and necessary for the employed third of the total population as medicine in general for the total poulation. Obvious as this seems, it is, nevertheless, very imperfectly — or perhaps, very reluctantly — comprehended by a surprisingly large number of medical men. We keep at it, moved by our conviction that, to the doctor, industrial medicine must be appreciated as a matter of medicine PLUS economics, while to the industrial executive, it must be understood as a matter of economics PLUS ethics.

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The Journal of Occupational Diseases and Traumatic Surgery

The Science, the Law and the Economics of Industrial Health

Volume 6 FEBRUARY, 1937 Number 2

Fracture-Dislocation of the Cervical Spine

Reduction With Skeletal Traction

W. GAYLE CRUTCHFIELD, M.D.,
Richmond, Virginia

THE problems involved in the treatment of fractures and fracture-dislocations of the cervical spine have, I am sure, received much attention from members of this society.*

I, therefore, regard it a privilege to present for your consideration the principle and technique of skeletal traction which we introduced in 1933[1] and more recently modified[2] for the purpose of simplicity and greater usefulness.

Fractures of the spinous and transverse processes will not be considered in this discussion, since they do not comprise the spinal cord and do not require traction for their correction.

Fractures and especially dislocations of the spine are of interest to those of us in neurological surgery, only because of the frequency with which they produce injury to the spinal cord and nerve roots. To decompress these neural structures it is often necessary to bring about a reduction of the dislocation or resort to laminectomy. With the use of skeletal traction, reduction of early dislocations of the cervical spine has become, for the most part, a routine procedure, and so far this method of treatment in our experience has completely eliminated the necessity for laminectomy.

Until recent years it was our belief, and I am sure this was shared by others, that rather than run the risk of producing or augmenting an injury to the spinal cord by attempts at manual reduction, little if anything should be done to correct a partial dislocation if skin traction failed—which was usually the case. Many patients treated in this manner are handicapped by limitation of motion and nerve root pain.

Some few dislocations can be reduced by traction against the chin and occiput, but this method is painful and unreliable. It irritates the skin and cannot be tolerated continuously when sufficient weight is applied for a therapeutic effect upon the lower cervical spine. The apparatus interferes with feeding, and produces a disagreeable choking sensation which in turn increases muscle spasm. Associated injuries about the face and mouth often render this method of treatment impossible or else increase the discomfort attending its use.

Skeletal traction is relatively painless and when properly applied it will reduce practically all acute dislocations, regardless of the cervical level with little, if any, danger to life or to the spinal cord function. Nerve root pain is almost immediately relieved, and reduction or improvement in the position of the vertebrae is often demonstrable within a few hours.

Skeletal traction is effected by the direct application of force to the skull. Modified femur tongs were used in our first three cases, and the use of similar tongs with good results was reported by McKenzie.[3] The disadvantage of instruments of this type is that because of their size the patient is prevented from turning to either lateral position.

To obtain traction Hoen[4] inserts wires extradurally through burr holes in the skull. While this method of applying traction is effectual and does not interfere with the nursing care of the patient, the same results are obtainable with the use of skull tongs which do not enter the cranial cavity, and for their application a much less extensive and time-consuming surgical procedure is required.

While infection of bone has not resulted from the use of skull tongs in any of our traumatic cases, nor in those reported by McKenzie[3], this, however, must be considered as a possible complication. The seriousness of the injuries under consideration and the more favorable results obtained from the use of skeletal traction seem thoroughly to justify the slight potential risk of infection involved in this method of treatment. With proper aseptic technique and early removal of the tongs, infection should rarely occur.

The materials and equipment needed for skeletal traction are as follows:

- Iodine
- Alcohol
- Mercurochrome
- 1 Hemostat
- Novocain (1%)
- 2 cc Syringe
- Hypodermic needle
- Scalpel (No. 11 Bard-Parker blade)
- Special drill points with guard*
- Geared drill
- Skull tongs*
- Fracture boards
- Sash cord
- Pulley attachment for head of bed
- Two 12-inch blocks

* FROM the Department of Neurological Surgery, Medical College of Virginia. Read at the Sixteenth Annual Meeting of the New York State Society of Industrial Medicine, Schenectady, N. Y., November 5, 1936.

* This instrument is made by George P. Pilling & Son Company, Philadelphia.

Method of Applying Tongs and Traction

A TRANSVERSE strip of hair about four inches in width is shaved from the crown of the head. The patient is placed face up so that his head, supported on a sandbag protrudes slightly beyond the head of the operating table. After the scalp is thoroughly prepared with iodine and alcohol, a vertical line is drawn (mercurochrome) to indicate the midline of the skull. A second line is drawn transversely on a level with the tips of the ears to indicate approximately the plane of the cervical articulations. The skull tongs are then brought forward with the traction bar turned down. This is placed against the scalp at the

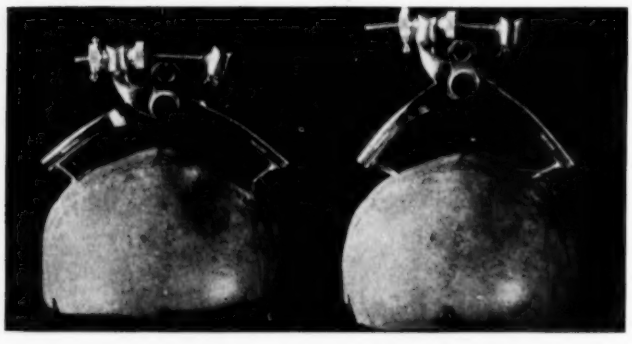

Fig. 1 Fig. 2

Fig. 1. Correct position of skull tongs.
Fig. 2. Incorrect application of tongs.

junction of the two lines just described, then the tong points are brought down on the transverse line and the points of contact marked to indicate the position of the proposed stab wounds. The tongs are put aside until both perforations have been completed. A novocaine wheal is made on each side, and stab wounds just large enough to admit the drill points are made down to the skull. The perforations in the bone are prepared by using a geared drill with a special point that prevents excessive penetration. Although having experienced no difficulty with the tongs pulling out, we have recently increased the depth of penetration from three to four millimeters. This provides for a grip sufficiently strong for any therapeutic amount of traction. After the perforations in the bone have been prepared, the tongs are inserted and made secure by adjusting the thumb screws. Dressings should be used to cover the scalp wounds.

In preparing the bed, fracture boards are installed to prevent the mattress from sagging. The head of the bed is elevated at least 12 inches so that the weight of the patient's body will exert counter traction. The pulley attachment is adjusted to permit a horizontal pull with a minimum of friction.

The characteristic deformity of almost all cervical dislocations is a forward displacement of the upper vertebrae, and most of these can be corrected with horizontal force. Occasionally, however, reduction can be hastened by the use of counter pressure as illustrated in Figs. 3 and 4.

The amount of traction applied is determined by the location of the vertebrae involved and the speed with which reduction is desired. Atlanto-axial dislocations seldom require more than 10 pounds for a few hours, whereas low dislocations may require as much as 20 or 25 pounds for six or eight days to effect a complete reduction. The majority of dislocations in the mid-cervical region can be reduced within two or three days using 12 to 15 pounds of traction. Regardless of the level involved, the routine 24-hour follow-up x-ray examination usually demonstrates a marked improvement in the position of the vertebrae. It is probable that with increasing experience the time element will be shortened by increasing the force of traction.

After reduction has been accomplished, traction is reduced to four pounds and continued for about one week. This is believed to be sufficient force to maintain the reduction, yet not enough to damage the interspinous ligaments and prevent apposition of the articular processes. The skull tongs should be removed as soon as is practicable — usually within 10 days or two weeks after their application. In the uncomplicated cases a plaster collar is applied while maintaining traction. The after care of patients confined to bed because of paralyses or severe associated injuries must be individualized.

Results

TWENTY-THREE cases have been treated by this method. Of this number there were 11 acute cases which we observed during treatment. Complete reduction was accomplished in all but one case and this was the first in the series. The result in this case was very satisfactory, but in view of subsequent experience it may have been improved had present methods been employed.

No improvement was apparent in two cases with dislocations of more than four months' duration. There was relief of nerve root pain and partial reduction in two cases in which treatment was moderately delayed (25 and 35 days). The latter

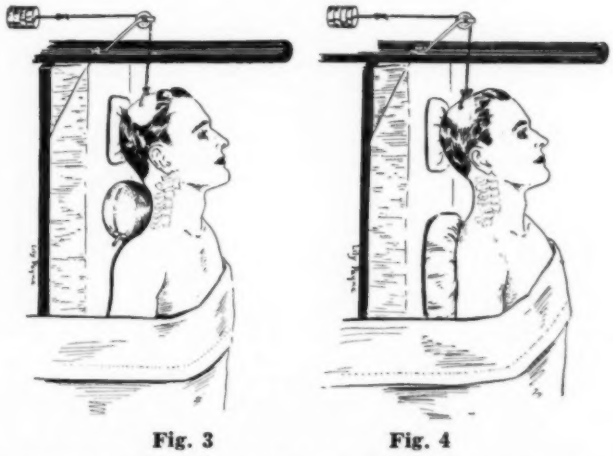

Fig. 3 Fig. 4

Fig. 3. Method of applying traction and counter-pressure for reduction of high cervical dislocations. The pneumatic tube supports the distal vertebrae, while traction corrects the forward displacement.

Fig. 4. A pillow is placed under the shoulders when the dislocation is below the third cervical vertebra. In such cases a pneumatic tube or sandbag placed under the neck would tend to prevent reduction or possibly increase the forward displacement of the upper vertebrae.

two cases, presenting dislocations of the fifth cervical vertebra, were treated for seven and nine days respectively. A maximum of only 10 pounds was used in one and in the other, a more recent case, the normal spinal axis was temporarily restored with 20 pounds, yet the fractured vertebra could not be brought to its correct position. A

patient now under treatment presented a dislocation of the fifth cervical vertebra of eight weeks duration. In this case a maximum of 15 pounds was used. Reduction was demonstrated at the time of the first follow-up x-ray examination, which was made five days after the application of skeletal traction.

Of the 23 patients treated by this method, seven died as a result of their injuries and without follow-up x-ray examination. Six of these deaths resulted from immediately complete physiological section of the spinal cord. In the management of such injuries it has been our experience that regardless of treatment there is never any neurological improvement in patients presenting immediately complete motor and sensory paralyses with loss of all reflexes below the level of injury to the spinal cord. There are occasions, however, when treatment is indicated to relieve nerve root pain or to decompress the spinal cord, in order to dispel any doubt on the part of all concerned that everything possible has been done to favor return of spinal cord function. Reduction of the dislocation is usually preferable to laminectomy in such cases. It more often relieves nerve root pain and is a much less formidable procedure for patients critically ill as so many of them are.

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Regional Ileitis

With Report of Two Cases

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IT IS ONLY within recent years that regional ileitis is described in the literature as an inflammatory disease solely of the terminal ileum. Bissell[1] mentions it as a disease which clinically suggests a colitis of the ulcerative type, nonspecific, characterized by fever, diarrhea and emaciation, eventually terminating in intestinal obstruction leading to the necessity of surgical intervention.

By Harris, Bell and Brum,[2] the disease is described in its earlier stages under the title "chronic ulcerating enteritis." The disease seems to be confined in its earlier stages to the mucosa of the small intestine, most frequently in the region of the terminal ileum. The submucosa, and to a lesser extent the muscular layers of the bowel suffer marked inflammatory hyperplastic and exudative changes, resulting in an enormous thickening of the bowel wall to two or three times normal size. This thickening of the bowel wall encroaches upon the lumen of the gut and produces varying degrees of stenosis, so that the intestine proximal to the involved segment may become greatly dilated.

The mesentery of the bowel so affected becomes thickened, fibrous and vascular with infiltration of hyperplasia glands. As the venous supply is engorged and greatly dilated, the mesentery presents "several times normal" the thickness, a fibrous, vascular, fan-shaped aspect. In area and extent, this process is indeterminate. It may trail off for several centimeters proximal to the disease, while distally it usually ends abruptly. Externally, the intestine may present an opacity suggestive of ulcer.

Palapably, these areas reveal a thick, firm area, in contrast to other portions of the involved intestine which are thick and velvety.

This opaque area presents the most fibrous stage of the disease, but does not justify the belief that the disease is confined to this region. Beyond this area of fibrous changes, the infiltrated and hyperplastic portion will show areas of ulceration in all stages of the process. Attention is called by Clute[3], in describing two cases, to the appearance of the involved gut and mesentery as one that has always been suggestive of hyperplastic tubercular infection.

A clearly defined picture of this condition has been observed by Crohn, Ginsburg and Oppenheimer[4], from the study of 14 patients. These authors define it as a disease of the terminal ileum, mostly in young adults, characterized by a subacute or chronic necrotizing and cicatrizing inflammation of the ileum leading to stenosis. It is frequently associated with fistulae formation and tumor mass in the right lower quadrant of the abdomen. These observers question the terminal ileum as being the only location or site of the disease, reporting a case of enteritis occurring in the jejunum, with clinical and pathological findings largely identical with those in the ileum. From the pathological anatomy, it is regarded as of at least a year's duration, and no case of lesser term is commented on. Then the terminal ileum is thickened, boggy and edematous, the serosa being a blotchy red. The mesentery of the terminal ileum is greatly thickened and contains numerous hyperplastic glands.

We have found isolated lesions, separated from the main hypertrophic mass by areas of grossly appearing normal mucosa. These isolated areas are in our opinion the earlier and primary lesions of the disease. They consist of oval mucosal ulcerations, about 1 cm. in diameter, located on the mesenteric border of the small bowel, and lying in the long axis of the intestine, where a sort of groove is naturally formed by the attachment of the mesentery. As the disease progresses, there are pathologic changes in the valve, which becomes rigid and constricted. A hypertrophic process is later noted, 10 to 14 inches distally of the terminal ileum including the ileal side of Baunin's valve.

Both the submucosal and muscular layers of the bowel exhibit these inflammatory and exudative changes in the shape of a considerable thickening of the bowel wall, as noted. The lumen of the bowel is distorted and contracted to a small aperture, while the intestine proximal to the diseased segment may be greatly dilated. As the disease becomes chronic, the mucosa of the enlarged bowel wall atrophies and is replaced by a fibrostenotic process. This tendency toward perforation and internal fistulae is seen in the sigmoid and the ascending colon or cecum, and when abscesses perforate the peritoneal cavity they are walled off. These form fecal fistulaes which do

not heal, owing to the substratum of inflammation.

Disease located in the gastro-intestinal tract is difficult to evaluate precisely, inasmuch as there are many signs of which the interpretation is obscure. The normal terminal ileum has its last coil soft and thin-walled, differing slightly from the upper ileum. It occupies the middle of the right iliac fossa and turns to the right as it enters the ileocecal valve. Fluoroscopic observation shows rapid push of the barium meal through the upper ileum, while in the terminal coils it is delayed, especially in the lower ileum. Ileal stasis of nine hours is abnormal, while the normal ileum is emptied several hours before. A reflex irritability of the ileocecal sphincter is the result of organic disease in the lower right quadrant, such as appendiceal and pelvic disease.

Microscopically, no specific features can be demonstrated. The stained histologic sections showed degrees of acute, subacute and chronic inflammation, with variations in the predominance of polymorphonuclear, round cell, plasma cell and fibroblastic elements. In the earlier stages, the lesion is a diffuse one, involving mainly the mucosa and submucosa, with the presence of some inflammatory serosal reaction. The mucus membrane exhibits areas of marked destruction, and at times the glandular structure is almost completely gone, leaving an atrophic layer of epithelium, the result of a regenerative process.

A granulomatous condition noted should not be regarded as evidence of tuberculosis. Wasserman reactions and Koch infections have not been observed. The giant cells formed in the ulcers are evidently due to foreign agents. Ileocecal tuberculosis hence is ruled out. Inflammation of the outer coats of the appendix is the result of adjacent inflammation, and is of frequent occurrence, but should not lead on to the wrong diagnosis. Roentgenograms of barium meals administered by mouth reveal the extent of the strictured area, with its distended loops of terminal ileum, delayed motility being another sign. Ulcerative colitis shows the same clinical manifestations, but the roentgenogram fails to show the colon to be affected in ileitis. However, fistulous communications may be noted on the adjacent ascending colon, and some strictural deformity observed there.

Classification under the "benign granulomas" seems to warrant Crohn's integration of regional ileitis from that group. He and associates distinguish four clinical groups, namely:

(A) acute, showing signs of intra-abdominal inflammation;

(B) symptoms of ulcerative colitis;

(C) stenosis of obstructive stage;

(D) fistulous stage.

A series of 11 cases analyzed by C. G. Mixter[5] under the above groups is described under the title of regional ileitis. The pathological findings in his cases were of non-specific ulcerating enteritis. Mixter reports eight of his 11 patients as of the Jewish race, the racial phase not having been reported by other writers. Cultures in his cases were negative for tubercular bacilli. Mixter asserts the disease to be definitely surgical, but warns of the hazard of operation. His mortality was 36.7%. His lowest mortality was in those cases treated by resection in one stage, and closure without drainage done in the early stage, where the disease was confined in the gut.

The later cases, where adhesions between the loops and fistulous communications occur, multiple-stage, two and even three stages, gave a mortality of 60%.

PATHOLOGY has sought the etiologic factor by means of histologic sections, cultures, and other media. The pathology of regional enteritis, of unproved generic origin, unclassified grossly and microscopically, etiologically unknown, has within a very few years been confronting surgeons, pathologists and research workers with a cycle so hazy that as yet no tangible basis has been established for defining a clinical entity. It has however, been definitely separated from granulomas, lues, Hodgkin's disease, chronic perforating lesions, or inflammatory reactions to operated hernias.

There are multiple infectious processes of unknown causation, some of which simulate carcinoma with its tumor-like inflammatory mass.

These benign granulomas have not been integrated, but it is well to differentiate them from regional ileitis, which is established today quite definitely by itself, as one separable from this varied group of general diseases.

Crohn, *et al*, paid particular attention to a relationship with Koch tubercular infection, but no case could be so verified. The appearance of the involved gut when exposed operatively together with the history, such as duration and symptoms of the disease, give the impression that one is here dealing with tubercular pathology. The chronicity, the induration, perforations, hyperplasia of the mesenteric lymphatics—these suggest a relationship to tubercular disease. Could this be a bovine type?

Have we not all operated for appendicitis and other lesions where little involvement or disease was noted, except hyperplastic mesenteric glands, and then designated them T.B. glands, although such have never been proved? These cases invariably recovered and remained well, possibly as a result of the exposure to air.

About half of the cases reported in the literature have had operations for appendicitis, and those cases where the process was intact and removed at operation for enteritis, did not show necrosal involvement. The rarity of the disease is the only redeeming feature because of the high operative mortality.

As a rule, young male adults predominate in this classification, the average age being about 30, while female cases account for about a third of the total.

Many of the patients for several months to two years before coming under operation complain of symptoms of diarrhea, fever, loss of weight and anemia, or what would appear to be the results of ulcerative colitis. The fever is rarely high or long continued, although we may observe temperatures rising to 103°F. True colitis, however, is more severe in its symptoms of diarrhea, but this disordered bowel function is the outstanding feature, there being from two to four loose or soft evacuations accompanied at this time by blood or mucus, in the shape of coagulated lumps. True colitis exhibits perineal fistulaes and perirectal abscesses and condylomas, absent here. Abdominal pain and visible peristalsis is another prominent sign, this being distributed over the lower abdominal parietes.

I AM presenting the history of two cases of enteritis, the one an acute perforating disease, the other such as is described by Crohn, *et al*:

Mrs. M.: Was admitted to the hospital about 11 P.M. because of acute abdominal pain over a period of 24 hours. The onset was sudden, acute, followed by emesis. She looked acutely ill. Temperature 102°; pulse 126; respirations 30. The patient stated she had had no previous attacks of this character but from time to time had so-called attacks of indigestion. For the past six months she had taken one tablespoonful of epsom salts with juice of a half lemon daily for the purpose of reducing her weight. She maintains she lost 25 lbs. She had the usual childhood diseases, typhoid fever at age of 11, influenza 1918, and occasional attacks of tonsilitis. Married 29 years, three children, one miscarriage at three months, 10 years ago. Family history irrelevant.

Inspection of abdomen showed it tense, fixed with generalized tenderness. On palpation, there are no irregularities, tumors or masses. No definite localization of tenderness is found. On percussion, hyperesthesia, flatulence and superficial tenderness noted. Auscultation reveals spasmodic peristalsis. No transmission of cardiac or respiratory sounds. The liver areas are not well outlined on percussion. The stomach cannot be outlined. The respiratory excursion is spasmodic and moist rales are noted in the base of both lungs. Pelvic examination is negative. The genito-urinary system is negative. Evidence of any strangulation of hernias not found. Nose and throat exhibit no redness or inflammation.

Laboratory: leucocytes 36,450; erythrocytes 4,410,000; hbg., 85%; polys. 93%; small monos., 6%; large monos., 1%. Urine shows trace of albumen and few granular casts.

The possibilities of the pathology could not conclusively be analyzed. It seemed best to temporize a few hours for tentative diagnosis and in order to combat the present shock. Intravenous solutions of 10% glucose in NaCl were administered, together with stimulants and morphine sulphate for a few hours. The following morning the patient seemed somewhat improved, and it was possible to decide definitely on an intra-abdominal lesion.

The patient was prepared for operation, which was carried out under spinal anesthesia, with the following findings: When the abdomen was opened, through a mid-right rectus incision, gas and a yellowish fluid escaped. This point of escape could not be determined at first, but after eliminating a perforation of the stomach or duodenum, a search beginning at the ileocecal junction of the gut was traced until near the termination of the ilium, when a sub-serous haematoma of the intestine on the opposite border from the mesenteric was found (6 cm. further.) A similar area was traced, in the center of which was a small perforation. This perforation was nearer the mesenteric border. And 8 cm. beyond, there was a similar condition, with a perforation the size of the end of a lead pencil. Between these areas and for 10 cm. beyond the last perforation were numerous hemorrhagic areas. The perforations were closed with two rows of No. 00 catgut. Beyond the last hemorrhagic area, about 10 cm., an ileostomy was done, using a No. 18F catheter with several perforations. The catheter was brought through a stab in the omentum, several cigaret drains used, and the abdomen was then closed serially. The patient left the table in good condition. Received 2000 cc. daily of 10% glucose in NaCl intravenously, plus 1000 cc. of rectal drip of 5% glucose in NaCl.

She made an uneventful recovery, and two years later was reported perfectly well.

The Second Case, H. B., aged 20 years, was admitted to the hospital June 4, 1935, because of acute pain in his abdomen of 24 hours duration. This was an onset of acute colicky pain, all over the abdomen, with emesis several times. For the past three years he had suffered periodic attacks of so-called indigestion. These attacks were uniformly attributed by him to faulty diet. Since the first digestive seizure, he had been troubled with constipation and used drastic cathartics, but he did not believe his constipation had grown worse during this period. At no time had he noticed mucus or blood in his stools. He did not think he had lost any weight. He had the usual diseases of childhood but no other illness. His family history was irrelevant.

Physical examination: The patient looks sick, coated tongue, foul breath. The sclera shows a slight tinger or icterus. Temperature 100°F; pulse 120; respiration 20. Abdomen is quite distended, tense, smooth. On palpation the recti are both rigid, most marked on right and in lower right quadrant. Percussion shows upper half (typonitic;) when the lower half is dull, the whole abdomen is tender. A mass can be palpated in lower right quadrant, in the region of the appendix. This mass is exquisitely tender, apparently fixed; it appears irregular but cannot be well outlined because of extreme tenderness. On auscultation, peristalsis is delayed and spasmodic. Rectal examination reveals a definite tender mass in the right iliac fossa, though not well outlined.

On general physical examination, there appeared no evidence of disease elsewhere. Clinically the stomach and liver, heart, lungs and kidneys were negative for diseases. Dentition good. The nose and throat normal. The skin had a muddy tint. No adenopathies. The blood count: erythrocytes 4,700,000; leucocytes 13,000; hbg. 90%; polys. 66%; small monos. 32%; large monos. 2%—which did not apparently support the acuteness of the disease.

A tentative diagnosis of appendical abscess was made, operation being advised and accepted.

Under spinal anesthesia, the abdomen was opened by a low muscle-splitting incision. Free fluid was found when peritoneum was opened, together with localized peritonitis involving the lower abdomen. The appendix was brought out and showed little gross change. The ileum was then traced, and about 20 cm. from the iliocecal junction, the gut suddenly took on a thick, dense, swollen edematous appearance. At this junction of normal and diseased gut the appearance of a constricting band was noted. Examining the mass further it was seen that about 12 inches of the gut was involved, together with its mesenteric attachments. The involved mesentery, a fan-shaped thickened aspect, infiltrated with glands the size of a millet seed to that of a hazel nut, interposed between a fibrous network. It was grossly 2 cm. in thickness, and the vascular supply was engorged, with the caliber of the vessels twice the size of the vessels supplying the adjacent region. The walls of the

gut were 2 cm. thick, velvety and edematous. On the free border two large white scars 3 cm. by 1.5 cm. were found. These scars had a fibrous feel, and were much thinner than other areas of the gut. The 20 cm. of ileum, together with its mesentery, were resected and an end-to-end anastomosis done. An enterostomy tube was inserted some 30 cm. from the anastomosis.

Cultures were taken and the abdomen closed. The cultures showed streptococci and colon bacilli. Postoperatively the intestinal tract functioned very well. The patient continued to show severe toxemia and died on the fifth day. The laboratory: Tissues, gross description: The specimen consisted of a portion of ileum that measured in the open state 15 cm. by 10 cm. The wall measured 1 cm. in thickness. The serosal surface of the ileum was injected and the wall appeared greatly thickened. The mucosa was deeply injected. There were two ulcers that extended through the mucosa and ran parallel to the long axis of the intestine. The lymph glands in the neighborhood were swollen and edematous.

Microscopic description: The mucosa of the ileum showed areas of ulceration that extended down to the muscularis. The base of the ulcer consisted of fibrous, cellular debris, and inflammatory cells. The edges of the ulcer were not undermined by, but gradually merged into, the uninvolved intervening mucosa. Throughout the areas of ulceration as well as in the rest of the sections there were large numbers of eosinophiles, numerous plasma cells and lymphocytes and a moderate number of large mononuclears. The interstitial tissue of the muscularis showed a diffuse infiltration with the inflammatory cells previously mentioned. There was a moderate amount of edema in the wall but considerably more observed in the mucosa. The serosal surface was greatly thickened by fibrous tissue. No marked degree of cicatrization could be seen in the section.

The appendix showed the lumen to be filled with fecal material. The mucosa was clear. The muscularis was infiltrated with some polynuclears and lymphocytes. The serosa was organized.

Diagnosis: acute and chronic ileitis, chronic active appendicitis.

The first case reported gives cause for analyzing what if any effect does magnesium sulphate, combined with citric acid daily ingested, have on the walls of the intestine.

The second case, however, is a typical ileitis.

CONCLUSIONS: 1. Ileitis occurs most frequently in young adults in any part of the small intestines.

2. The etiology still remains unknown.

3. Early diagnosis and surgical removal carry a low mortality and little morbidity.

4. Medical treatment cannot arrest this ulcerating, necrotizing and cicatrizing process.

5. Multiple-stage operations carry a high mortality.

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The Hernia Problem

—*Some Present-Day Aspects, with Special Reference to the Truss-Injection Method of Treatment*—

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THE modern operation for the cure of inguinal hernia was perfected by Bassini and Halsted 47 years ago.* The principles underlying this type of operation were immediately accepted by practically all surgeons. Within a few years many surgeons were inclined to believe that the problem of the cure of inguinal hernias was practically a closed chapter. About all that remained to be accomplished was to convince the general public of the necessity of the operations.

Today, notwithstanding the fact that many hundreds of thousands of persons have been permanently cured of inguinal hernias by operation, the hernia problem is by no means entirely solved. Attendance at a few sessions of almost any compensation court will convey some idea of the magnitude of the existing problem as regards industry and the employees of industry. Likewise, a few hours spent in a shop specializing in the fitting of trusses will convince the observer that the operative method of treatment has failed to reach a very considerable portion of those who have hernias. Estimates as to the percentage of hernias which do not come to operation are, for the most part, mere guesses. The truth varies greatly in different localities, but by and large I would estimate that at least one half of all inguinal hernias occurring in this part of New York State are never operated. This continued neglect of the possibilities of operative cure on the part of the general public can scarcely be ascribed to ignorance, because one of the most surprising observations I know of concerning hernias is the number of doctors who wear trusses.

I mention the foregoing simply to draw attention to the fact that from the point of view of the public there are certain adverse factors associated with having hernias cured by operation, and that a method of treatment which is unquestionably superior to a truss and which, at the same time, does not have the handicaps associated with operation, must constitute a great advance in the treatment of this condition.

Quite recently there has been brought to the attention of the medical profession and the public a third method of treating hernias, namely, the injection method, or—as it should be called, because the wearing of a truss is an essential part of the procedure—the truss-injection method. Insofar as this method calls for no formal operation, no anesthetic, no hospitalization, and no prolonged period of loss of earning power, and is inherently very much less expensive than the operative method, it eliminates most of the objections raised by the public to the operative treatment.

From the data now available it seems highly probable that the truss-injection method of treating hernias is destined ultimately to compete on approximately even terms with the operative treatment as regards the actual permanent cure of the great majority of reducible inguinal hernias.

* Read before the Sixteenth Annual Meeting of the New York State Society of Industrial Medicine, at Schenectady, N. Y., November 5, 1936.

Nevertheless, it is too early as yet to make any direct, statistical comparisons between the operative and the injection methods as to late end results. As far as my own experience is concerned it is still in the individual case record stage of development, which leads me to select from my own records several individual histories which will, I believe, clearly indicate the possibilities inherent in the injection treatment.

Case 1: Male; age 56; recurrent, right, indirect inguinal hernia. Aside from the uncertainties of cure following a second operation, to be operated during the first half of 1936 was simply out of the question because he could not arrange the time off. A truss held this hernia very well while he was on his feet, but if he coughed or sneezed while he was driving a car it came down. He had eight injections, lost no time at all from work, and there has not been a trace of the hernia since the truss was removed over four months ago. Furthermore, for the first time since his original hernia operation performed elsewhere several years ago, there is no subjective feeling of weakness or discomfort in the right inguinal region. It is my opinion that the result in this case is far superior to anything we could have expected from a second operation. One thing is quite certain, and that is that even if this man has to repeat the injections at intervals for the rest of his life, it is going to be very hard ever again to sell him a hernia operation.

Case 2: Male; age 79; left, recurrent inguinal hernia; right scrotal hernia. Not only is he 79 years old, but all lymph nodes are markedly enlarged and his blood count shows 44,000 w.b.c., mostly lymphocytes. Partly because of the enlarged inguinal glands, his truss would not keep this right inguinal hernia reduced. This feeble old man, suffering from a chronic form of lymphatic leukemia, was obviously inoperable. I thought even injections were hopeless, but the right-sided hernia was so troublesome that I consented to try some injections to see if, with the injections plus a truss, we could improve conditions for a time. To date he has had 17 injections, the first 10 at intervals of twice a week, and since, just now and then when he happens to come in the office. The left, recurrent hernia disappeared after about six injections. To my great surprise, the right hernia also disappeared after six or eight injections. I have no idea whatever that this right-sided hernia is actually cured, but a light-fitting comfortable truss has held this hernia for the past four months, and the old fellow is quite comfortable so far as his hernia is concerned. The left, recurrent hernia is apparently cured.

I mention this case because it serves to illustrate a phenomenon observed in practically all of our cases; namely, that entirely irrespective of the question of permanent and absolute cure, the tendency for the hernia to come down in spite of the truss, disappears after four or five injections, and from then on the average individual experiences little more discomfort from wearing his truss than he does from wearing his shoes. Time and again they tell us that they are in no hurry to discard their trusses because they no longer bother them.

Case 3 represents, I believe, what may be expected as a typical result in an average favorable case. Male student; age 23. He is earning his way while studying for a Master's degree. He was turned down when he applied for a job because of a left, complete, indirect inguinal hernia. He had had a right inguinal hernia operation in 1929. When I saw him he had neither the time, the money, nor the inclination to be operated. Between February 26 and May 6, 1936, he received 13 injections. When college closed about June 10 he started out looking for a job. He found one in a nearby city, but he also found that the employer requested a physical examination. At the examination he told of having had the hernia injections. The examiner was skeptical about the injection treatment, which led to his being sent to a number of doctors for examination. The final result was that he got the job and worked at it all summer. Also during September and October he played strenuous tennis, and to date there is absolutely no evidence of recurrence.

WE HAVE been using the injection treatment during the past eight months only, and consequently we have no late end results to report. But judging from the results so far obtained, I see no reason for discounting the optimistic reports of Bratrud, Rice and other pioneers in this form of treatment. On the other hand, for this method to be an important advance in the treatment of hernia it is not necessary that it be advertised as promising a permanent cure in the sense of the result obtained after a really successful operation. We only promise our patients who elect to try the truss-injection method that, after a certain number of injections, the hernia will not come down while they continue to wear their trusses. This is quite enough to satisfy the cases we elect to inject. The fact that most of them find that ultimately they can discard their trusses for months or years at a time without the hernia coming down, is an added benefit which we only hope will accrue in a goodly proportion of cases.

The operative method has been practically standardized for many years. Its possibilities and its shortcomings are quite definitely known. From the point of view of the surgeon the operative treatment is more than 90% satisfactory. The operation takes only about a half hour of his time, and the job is completed. Actually, however, the problem is by no means so simple, otherwise practically everybody would have their hernias operated almost immediately.

If we study the shortcomings of the operative method from the point of view, let us say, of a physician with a hernia of his own which he wishes to have cured, I believe that we can list the chief objections to hernia operations about as follows: The operation necessitates a long period of loss of earning power. This loss of earning power averages at least six or eight weeks. Even a safe operation plus at least two weeks in bed is something even doctors will avoid if possible. The actual mortality following operation is very low. Death from embolism occurs once in about 300 cases. Nevertheless, distressing and worrisome complications are by no means rare. The Mayos report 37 cases of pneumonia following 1066 operations for hernia. Phlebitis occurs more often than we would like to see it, and complications following catheterization are by no means rare.

Lastly, recurrences occur far more frequently than we like to admit. Statistics on this phase of our problem vary according to the length of time patients have been traced after operation. My

own office files contain the records of 587 cases of indirect inguinal hernias operated by myself and my associate, Dr. C. W. Woodall. Of these cases, 417 have been traced for periods ranging from one to 29 years with 41 recurrences, or 9.8%, which is practically the same as reported by B. L. Coley and others who have traced their cases over long periods of time. I believe that the truth concerning recurrences following inguinal hernias can be stated about as follows: Cases of indirect inguinal hernias operated by competent operators will, on the average, show about 5% of recurrences at the end of the first year after operation, and about 1% per year additional thereafter.

In the direct type of inguinal hernia the postoperative recurrence rate is much greater than the figures just quoted for the indirect type; 25% of recurrences over a five-year period in cases operated for this type of hernia would seem to be a conservative estimate.

As contrasted with operation, the injection method calls for practically no loss of earning power during the period of treatment. At most, about 12 half days taken off to go to the doctor's office should cover all lost time. In our experience, farmers, day laborers, engineers, and doctors have gone about their work as usual. (See Table 1 for comparative costs of operative and truss-injection methods of treatment).

	Operation		Injection
	Cost to Private Patient	Compensation Cost to Carrier	
14 days in hospital ($4.50)	$ 63.00	$ 63.00	———
Operation room fee	8.00	8.00	———
Anesthesia	5.00	5.00	———
6 weeks' loss earnings ($25)	150.00	———	———
8 week's compensation ($16.66)	———	133.28*	———
Truss	———	———	$ 8.00
12 half days ($2.50)	———	———	30.00
Surgeon's fee	75.00	75.00	75.00
TOTAL	$301.00	$284.28	$113.00

* Additional loss to patient of 8 weeks ($8.33) or $66.64 additional actual cost.

Table 1. Comparative Costs of Operation and Truss Injection Methods of Treating Hernia for Patient Earning $25.00 per week.

Serious complications are apparently almost unknown. Temporary hydrocele of the sac may occur but is readily controlled by aspiration. Occasionally some of the injection fluid may enter the peritoneal cavity. This is usually due to a technical error on the part of the surgeon, and can be avoided with proper care. When it does occur it causes severe pain for a few hours but no lasting symptoms. Severe pain and soreness lasting several days are caused by injecting the fluid directly into the spermatic cord. This is again a technical error by no means inherently associated with the injection method. In our experience one out of about five or six injections is moderately painful at the time of injection, and is followed by soreness lasting about 24 hours. This is probably due to the injection fluid coming in contact with sensory nerves.

If a single patient were to have all of the above-mentioned complications in the course of his treatment, they would, in my opinion, taken all together, scarcely equal the discomfort associated with having to be catheterized for a few days after a hernia operation.

The individual who selects the injection treatment is compelled to wear a truss for at least about 12 weeks. However, it has been our experience that most patients who have had trouble wearing trusses before the injections were started have little trouble afterwards, because after the first four or five injections the hernia disappears and from then on the truss can be worn with a minimum of discomfort.

If the injection treatment were to be used for no other purpose than to make the wearing of trusses easy and satisfactory for the great army of truss wears it would constitute a real advance in the treatment of hernia.

IN ATTEMPTING to evaluate the possibilities inherent in the injection method one must have a fairly clear concept of the production of, and the cure of, hernia. It is now quite universally recognized that the essential factor necessary for the development of an indirect inguinal hernia is the hernia sac, and that in the great majority of cases this sac is of congenital origin. Conversely it is now universally recognized that the obliteration of the sac is the one absolutely essential factor in the cure of hernia. Many years ago Anderson demonstrated that ligation of the sac is all that is necessary for the cure of hernia in infants and children, and this probably would hold true as regards hernias in adults, except that in a large proportion of adult hernias the long continued presence of abdominal contents in the sac has served to stretch and thereby make ineffective the muscles guarding the internal ring.

In operating we make a rather extensive dissection in order to excise and ligate the sac. The sac is usually a gossamer-thin membrane, and ligation of the sac gives no noteworthy strength to the abdominal wall at the point of ligation. From our knowledge of the behavior of the peritoneum to irritants it is definitely predictable that we should be able to obliterate the sac by the use of irritants provided the sac is kept collapsed by some pressure such as a truss. It has now been definitely proved by actual dissections that the sac can be obliterated by the injection treatment.

Individual surgeons hold widely varying concepts regarding how best to make use of such structures as the internal, oblique, transversalis muscles in the cure of hernia. In general, surgeons have been inclined to ascribe a passive function, and all sorts of devitalizing and unanatomic methods have been devised with the idea of plugging up the canal with masses of muscle tissue.

In normal individuals without hernias the action of these muscles in closing the canal and thus preventing protrusions into the canal is active and not passive and can be observed in the course of almost any laparotomy performed for conditions other than hernia. Palpation of the region of the ring and canal from the inside reveals that with relaxation of the muscles the region of the canal can be palpated as a soft area, along which the peritoneum can be pushed outward almost to the fascia of the external oblique. Contraction of the abdominal muscles is simultaneously accompanied by contraction of fibers of the internal oblique and transversalis located in the region of the ring so that the ring becomes firmly closed and the ap-

parent weak spot in this region instantly disappears. I firmly believe that one of the chief objectives in the cure of hernia should be to restore the normal functioning of the muscles guarding the internal ring.

In operations for the cure of hernia, either with or without transplantation of the cord, we attempt to establish permanently an unnatural relationship of the internal oblique muscle to the internal ring and the cord.

I feel that just so far as we succeed in destroying the normal functions of the muscles in this region, our attempts to suture the internal oblique in abnormal relationships are liable to predispose to, rather than to prevent recurrences.

The injection method apparently offers ideal possibilities of contracting and, to some extent, filling up the inguinal canal with fibrous tissue, while at the same time leaving the internal oblique and transversalis muscles in position to function normally. On the other hand, if the injections are given carelessly and indiscriminately into the muscle instead of into the canal, the muscles may be seriously damaged.

The third object to be accomplished in the operative cure of indirect hernia is the reduction in the size of the external ring. In operating, this is accomplished by imbricating the external oblique so as to make the ring as small as is consistent with the safety of the cord. This is also accomplished by the injection method, apparently largely as a result of the contraction of the scar tissue formed by the injection material. An external ring, which at the beginning of the injections will admit the finger well up into the canal, contracts a few weeks after the injections are given in the region of the ring so that it often can scarcely be located except by palpating the cord as it comes out of the ring.

ALTHOUGH the several solutions now in use for the injection treatment of hernia are apparently satisfactory, there is every reason to believe, now that interest has been aroused, that further research and experimentation will produce still further improvement in the solutions.

One of the chief hazards which is almost inevitably, for a time at least, going to be associated with the injection treatment will be the inexperience of the injecters. For this treatment to be a success, the fluid should be deposited in the areolar tissue surrounding the cord in the inguinal canal. This is not difficult provided the person giving the injection has a clear concept of the anatomy of hernias. Generally speaking, the best preparation for this work should be the anatomical knowledge gained by operating a considerable number of hernias. Also from time to time the person giving the injections should have the opportunity to refresh his mind by operating hernia cases.

In conclusion I will say that, taking our experience with the truss-injection method to date and evaluating this experience in the light of other data available on the subject, it is my belief that this method is destined to play an important role in the treatment of reducible, inguinal hernias. I am fully convinced that, by this method, the average hernia is readily apparently cured and that this apparent cure will persist indefinitely if the patient continues to wear his truss. Also I am convinced that after a time many patients can discard their trusses altogether for months at a time with no sign of recurrence. I believe that results will improve with the increase of skill and experience on the part of those using the method, and that we may also expect further improvement in the composition of the solutions used for the injections. Just how long patients should continue to wear their trusses and how many can finally discard their trusses altogether are questions which I do not believe can be definitely answered at the present time.

Book Contamination

by Bacteria

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PROBLEM: To what extent may books be contaminated by bacteria? Simple experiments were conducted, in which micro-organisms from the pages of books were washed off, plated out, and cultured. Readings were taken after 48 hours' incubation at both room and body temperature, and then simple determinative diagnoses and comparative numerical estimates were made.

Discussion: Because so many books circulate in homes, schools, churches, etc., they were regarded as possible intermittent carriers or fomites of infection. In cases of scarlet fever, diphtheria, poliomyelitis, meningitis and kindred ailments, books found in the rooms of patients so suffering are invariably destroyed or burned. The reason is obvious, for the sputum from such individuals may contain the virulent organisms which may be carried directly by the hands or sneezed or coughed on the leaves of books. Should another person handle the book, he might conceivably inhale the dust or debris particles previously expectorated or sneezed on the book leaves. In the case of tuberculosis it is known that the organism will live for months in dust and dry sputa. Thus a tubercular person who coughs or sneezes on a book may transmit the diseases to other individuals who handle it. Furthermore, the person so affected may wet his or her hands or fingers in order to turn the page, and in so doing contaminate the book by direct contact.

Method: The pages from various very old school books and some recent ones were collected, preferably from schools and classes where the books had been in recent use by students. For study, the books were classified as having come from libraries, kindergartens, and elementary junior or senior high schools. The oldest books obtainable, which were from five to 10 years old and falling apart, were given special attention. The leaves were cut to uniform size, under sterile conditions with the hands and scissors previously immersed in alcohol. For comparative purposes, four inches square was the size adopted, although in some instances whole leaves were used. A series of test tubes were filled with 5 cc. of sterile water and then labeled to correspond with books obtained from all over the city of Baltimore. Single or part pages were allowed to soak in these sterile tubes for periods varying from 15 minutes to one hour, with frequent agitation. At the ex-

piration of the time intervals, 1/10 cc. of the wash water was plated on either ordinary nutrient agar, cough, or blood agar plates. The usual control plates were set up for culturing with either sterile water or wash water obtained from fresh paper taken from unused or new books. An alternative experiment was attempted when dirt, grime and dust were scraped from the worst books surfaces, weighed, and mixed with sterile wash water for periods of from 15 minutes to one hour. The usual plating was carried out afterwards, using 1/10 cc. of the wash.

RESULTS: The results were rather surprising in that ordinary school books showed comparatively few microbial colonies, with only a few pinpoints on the blood plates and occasionally a few hemolytic strains mingled with spreaders and molds. In books not two years old and in good condition, the average number of colonies per 5 cc. of one-hour wash water varied between 700 and 1,000 per full page, practically all of them being "R" non-pathogens. Some of the elementary school books in recent use revealed pages contaminated by staphylococcic, streptococcic, and diplococcic colonies and some "S" pinpoints. Every plate exposed to page wash water showed a few "R" type subtillis or mycoides colonies, as well as bread and Penicillium molds. On old or condemned books smeared with visible dirt and grime, the average number of colonies on blood agar plates per 5 cc. of wash water with one hour immersion per page was approximately 10,000 with the "S" pinpoint colonies predominating, and with several hemolytic colonies noted. Old books with glazed-paper pages revealed an average count following one hour washing of approximately 6,000 colonies per 5 cc. of wash water. Again the "S" colonies pinpoints predominated, with hemolytic strains in evidence.

CONCLUSIONS: This study suggests that books, not too old or dilapidated, are not serious indirect vectors of infectious diseases. Books that are kept for some time before being redistributed, do not appear to have many viable pathogenic bacteria present on the pages. The organisms that remain for long periods on the surfaces of pages include, the spore bearers, Mycobacteria, and the molds. Old books with visible dirt and grime smeared over the surface are capable of harboring many more pathogenic bacteria than clean or new school books. Old textbooks used for many years in schools, as evidenced by dilapidated conditions and the pages smeared with dirt and grime, are quite likely to be possible fomites of infection, particularly where recent epidemics have occurred, and the books remain in constant circulation. In all instances the dirt washed off from pages of books of this type showed the largest number of pinpoint and hemolytic strains of possible pathogenic bacteria. School books kept by students for one semester or one school year and used by one individual only are not dangerous fomites, as ordinarily several days to months elapse before redistribution. The different kinds of paper seem to have some effect upon the length of time bacteria will live on the leaves. Soft crude paper appears to be capable of holding more microbial growth than the partially or highly glazed papers.

RECOMMENDATIONS: (1) Old books frequently exchanged might, to advantage, be opened up and put out in the sunlight for several hours where practicable. (2) Books which are dilapidated, out of date, and filthy with grime, should be destroyed. (3) Books used by sick children should not be handed out to other students immediately (most pathogens soon lose their virulence or die out entirely if kept away from the body tissues for some time.) (4) Destroy books coming from quarantined homes, or at least hold them for several months before redistribution. (5) Books used in infectious disease wards of hospitals should not be redistributed. (6) Books used by people suffering from colds, sore throat, influenza, measles, scarlet fever, diphtheria, meningitis, infantile paralysis, whooping cough, pneumonia, tuberculosis, and books read while convalescing, should be stored for a safe period of time before redistribution. If the home is quarantined, books used by the sick patient should be burned entirely. (7) Books used by tubercular patients should, under no circumstances, be used by anybody else. (8) When child epidemics occur in schools, books from sick children should not be redistributed until several days have elapsed. (9) Any books used by groups and redistributed several times during a semester should be either sterilized or held for a period of two or three weeks before redistribution, because pathogenic bacteria die out or lose virulence outside the body. (10) The U. S. Public Health Service advises on books as follows:

Books used by patients exposed to infection should be handled with extreme care; disinfect by dry heat, formaldehyde gas, or sprinkle a few drops of formalin on each page and place in a closed receptacle for at least 24 hours; unbound books and pamphlets may be disinfected by live steam. (11) There are two methods of spreading book bacteria: by direct finger or hand contact, and inhalation of book dust or debris.*

Peroral Endoscopy

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THE discussion of this large subject considers briefly some of the major points in regard to foreign bodies in the food and air passages.** The remaining portion is to be devoted to diagnosis and treatment of various pathological conditions in which we feel bronchoscopy is of definite value.

Since approximately 80% of the foreign bodies in the food and air passages are in individuals of 15 years and under, our first impression is that a presentation of this subject before a group of railway physicians and surgeons would not be well chosen. Yet, this is a vital matter to all physicians, and even to laymen. We never know just who will be the next foreign body case, and many of us have children who are likely subjects.

Dr. Chevalier Jackson,[1] the Dean of bronchoscopists, states that 87% of his foreign body cases are attributable to carelessness. Grouped under a few heads, these are: (1) carelessness in the preparation of foods; (2) carelessness in eating and drinking; (3) carelessness in putting inedible substances in the mouth; (4) carelessness of parents and nurses; (5) carelessness in play.

* H. M. R. JONES: *J. Path. & Bact.*, XLII No. 3, 1936, pp. 605-614.

** Presented before the Congress of Railway Surgeons: Meeting of the Chicago, Milwaukee, St. Paul & Pacific Railroad Surgical Association, Chicago, November 5, 1936.

Many foreign bodies are overlooked—failure to consider such a possibility, the apathetic attitude of the physician, absence of history, skepticism even in the face of circumstantial evidence, are some of the reasons. The symptomless interval, and the simulation of relatively common diseases, such as asthma, bronchitis, pneumonia, abscess, bronchiectasis, and tuberculosis, may further account for the failure to diagnose the foreign body.

There are two types of foreign bodies: (1) vegetal, and (2) all others. Vegetal substances such as nuts, seeds, beans, etc., set up a violent reaction in the mucosa, with secondary swelling and suppuration, whereas other substances do not, unless they are obstructive.

In considering the second phase of this subject, we shall confine ourselves to the part that the bronchoscopic examination might play in making an original diagnosis or in the completion of a clinical picture. The attitude one might take toward a laparotomy might also be taken toward a diagnostic bronchoscopy. In other words, there are frequently rather definite expectations as a result of previous studies which might be more conclusively established by such an examination or operation. For example, a comparison may be drawn in performing a bronchoscopy for a carcinoma of the lung and a laparotomy for a carcinoma of the colon. However, not infrequently an exploratory examination is decided to be compatible with good judgment and with the hope of arriving at a more complete diagnosis. Fortunately, a bronchoscopy can be a very simple and safe procedure, with only rare possibilities for trouble. Aneurysm is considered to be the only real contra-indication.

IN THE last few years there has been notable development in the field of thoracic surgery. This has been enhanced by the close cooperation of the bronchoscopist. Examination to show the extent of the lesion and biopsy of suspicious growths is essential. Jackson and Konzelman[2] have obtained positive biopsies in about 75% of their cases of bronchial carcinoma. Roentgenograms may show the shadow of the primary lesion or the secondary changes as a result of obstruction to a part of the tracheobronchial tree. It is the duty of the bronchoscopist to determine which of these conditions is present.

The etiology of lung abcess and drowned lung includes foreign bodies, bronchial stenosis, obstructing granulations and other conditions. Therefore, a diagnostic bronchoscopy should be performed regardless of the hope for therapeutic benefit.

No untoward results have been observed by Myerson[3] in a series of 60 patients with pulmonary tuberculosis examined by the bronchoscope. These patients were examined because of general indications requiring bronchoscopy. Under this grouping were considered cases of pulmonary tuberculosis presenting obstructive phenomena, hemoptysis of unexplained origin, and asthmatic breathing.

Atelectasis or massive collapse of the lung is not an uncommon condition. It may be the result of a growth, stenosis, or foreign body. Under the latter heading mucous plugs may be considered with the resultant pneumonic changes sometimes resembling pneumonia. This condition is of particular interest to the surgeon. Many cases of massive collapse have occurred in the early postoperative stage of various surgical operations. Postural changes, prompting the patient to cough when necessary, and the withholding of excessive doses of morphine will result in spontaneous recovery in many cases. There are occasionally some cases which require bronchoscopic intervention.

The differential diagnosis between a chronic bronchitis and a bronchiectasis often requires a bronchoscopic examination and pneumonography with iodized oil. The aspiration of stagnated secretions is essential before the injection of the opaque oil. In addition, the elimination of such etiological factors of bronchiectasis as foreign bodies, stenoses and neoplasms is a definite indication.

Jackson[4] states that bronchial asthma affords a large field for bronchoscopic study. One must keep in mind that many of the persons who wheeze may have a foreign body, narrowed bronchial lumen, tracheal growth, or some other chronic pathological condition of the chest which might explain their difficult breathing.

Unexplained cough may be the result of tracheal ulceration, a small endobronchial growth or non-obstructing, non-opaque foreign body. Clinical and roentgenographic signs may be absent, yet there is a definite indication for examination.

The larynx, trachea and larger bronchi can be inspected without general anesthesia. According to Tucker,[5] among the points noted in bronchoscopic examination may be mentioned the appearance of the bronchial mucosa, the quantity and character of secretion, evidence of abnormal mobility, fixation and deviation of trachea and bronchi and, finally, a careful inspection of the bronchial movements during respiration and cough. The presence of bronchial dilatation, compression stenosis, intrabronchial growths, ulceration and infiltration can be readily determined.

Conclusions

IT IS the desire and effort of the bronchoscopist always to confer with the internist, the surgeon and the roentgenologist.

2. Bronschoscopy may play an important part in arriving at a correct diagnosis.

3. In many conditions, positive information can be obtained by no other procedure than by bronchoscopy.

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Discussion:

L. F. McBRIDE, M.D., F.A.C.S., Chicago: Removal of foreign bodies from the air passages is a spectacular procedure in the eyes of the laity, and it has become quite a news item. It is not uncommon to pick up a morning paper and find that some child has been rushed by airplane to a far part of the country for the removal of a foreign body.

One of the most difficult situations is a peanut in the air passages. The longer it is present the more difficult it is to remove because of the intense reaction that occurs. In the food passages, chicken bones cause considerable trouble. People come in constantly complaining that they swallowed a chicken bone, and they are sure it is there. They can have an abrasion made by the bone going down which will give symptoms of painful and difficult swallowing. If this pain has not appeared within 48 hours, it is likely that the bone was not swallowed. In looking for bones in the esophagus it is well to put some cotton in the barium, as the strands of cotton will catch on the chicken bone and we can see it more plainly.

The earlier the diagnosis is made, and the earlier the foreign body is removed, the better.

So far as carcinoma is concerned, Dr. Knight has given us an excellent resumé of what we must expect regarding the diagnosis of carcinoma. I have had only one serious accident after the removal of tissue for biopsy in which I had a fatal hemorrhage immediately following examination. There have been 296 cases of carcinoma reported with no deaths at the time of removal with the bronchoscope, but 10% of these individuals died later of fatal hemorrhage. I do not feel that the bronchoscopy had anything to do with the death.

In the treatment of lung abscess the use of the bronchoscope has proved satisfactory in a great many cases, especially if the abscess is not of too long standing. Abscesses which are enormously large, with thickened walls may be improved by the use of the bronchoscope, so that the patient can be gotten into shape for surgery. Bronchiectasis has not done so well even by repeated aspirations.

"Industrial Environment"

Book Review by

C. O. Sappington, M.D., Dr. P.H.

THIS is a pocket manual of 336 pages setting forth practical methods of investigation, as suggested by the International Labour Office of Geneva.

As the preface states: "The main object of preparing this manual was, in fact, not to produce a learned 'treatise' setting forth and criticizing theories and providing a voluminous bibliography, but merely to give practical information in essentially concise form, without sacrificing clarity, so that the work might reach the largest possible public. The manual is produced in pocket-book form and can be easily carried about in factory, workshop, and so forth, by any person whose task it is to ascertain that the hygienic conditions there are satisfactory. The novice, as well as the trained observer, will find information in it calculated to assist them in their researches. The numerous diagrams and tables in the manual should also prove of value.

"One word of warning is essential. Some of the methods described, in particular certain methods of chemical research, are delicate and complicated as regards their application, and it is not everyone who could apply them. Only a competent expert is in a position to do so effectively, and where they are not entirely carried out by such, his collaboration should at least be secured."

The book is divided into various sections on the following subjects: Measurement of Atmospheric Pressure—Measurement of Temperature—Humidity and Cooling Power—Ventilation—Photometry—Estimation of Dusts—Measurement of Noise—Industrial Toxicology (including general consideration and special parts)—and Units and Definitions.

For the most part, the methods mentioned in this reference handbook are mostly European, there being but few American methods detailed; in procedures for the estimation of dust, for instance, the impinger is described and the sampling procedure and estimation detailed; in another instance, the method of analyzing samples of the air for lead content includes the consideration of the colorimetric procedure where s-Diphenyl Carbizide is used (it will be remembered that this method was devised by Ficklen and Krans in this country and published in the *Journal of Industrial Hygiene*, April, 1931).

A great deal more space is devoted to the consideration of the physical aspects of the atmosphere in this volume than in any similar work, and it is very valuable in this respect. Also, considerable space is devoted to the measurement of noise, which will undoubtedly be of greater value in the future. Likewise, there is much useful information regarding photometry.

It seems to the reviewer that no one should be under the illusion that he can conveniently carry this pocket volume around with him in factories and work out methods and details for sampling air; obviously to save time, the industrial hygienist should know what these methods are and provide himself with the proper apparatus and procedures before going into the workshop.

The chief value which this work will probably have for American investigators will be as a reference volume, particularly in comparing our own methods with those of European scientists.

The book is published by the International Labour Office, Geneva, 1936, and is priced at $2.00. Distribution is effected in the United States by the World Peace Foundation, 40 Mount Vernon St., Boston, Massachusetts.

Minor Maladies

Book Review by

C. O. Sappington, M.D., Dr.P.H.

MINOR Maladies and Their Treatment, by Dr. Leonard Williams, is the sort of book that every physician should have for reference purposes because it carries a lot of information on different subjects in one small volume.

A glance at the table of contents gives some idea of the content of the material of the book: Colds, Coughs, and Sore Throats—Indigestion—Constipation, Diarrhea, Vomiting, and Giddiness—Rheumatism, Neuralgia, Headache—Salient Symptoms—Minor Glandular Insufficiencies—General Health—Advancing Years—Insanity—and Some Drugs and Their Uses.

As the author states: "This book is entirely egotistical, and it is in many respects heterodox. It was first published in 1906; in each succeeding edition very considerable alterations have been introduced; the present one embodies changes greater in number and more considerable in importance than any of the others . . . Insofar as this book can pretend to be anything higher than an ephemeral practical aid to everyday practice, the larger claim would rest on the fact that in successive editions it has endeavored to reflect the current of thought which is moving opinion among those who are really progressive."

The volume contains 420 pages, and a well-classified index and is priced at $3.75. The Sixth Edition, revised, was published in 1934 by William Wood & Company, Baltimore, Maryland.

External Use of Cod Liver Oil

for Ulcers, Wounds, Burns and Skin Lesions
—A Review—

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COD LIVER OIL has long been used empirically by fishermen for treating wounds, frostbites and skin lesions. Apparently the results obtained in fishermens' families attracted the attention of the medical profession, for general practitioners in sea coast towns used cod liver oil for treating burns. Subsequently hospitals began to test the therapeutic value of cod liver oil for treating various types of skin lesions. As early as 1885 Shoemaker[1] reported to the Section of Practical Medicine of the American Medical Association that oil is absorbed by the tissues. Subsequently he said: "If a large-sized hypodermic syringe be used, and the oil (cod liver oil) deposited deep into the cellular tissue, it usually disappears in from 12 to 24 hours without any unfavorable results. That the oil (cod liver oil) is absorbed and assimilated can be demonstrated by injecting the same quantity of castor oil, its viscidity being lessened with an equal amount of almond oil, and the result will generally be a satisfactory laxative action within one or two hours' time." Heald[2] reports that by 1922 cod liver oil was being used for injuries, burns and infected wounds at the Royal Free Hospital with considerable success. During the past five years many investigators have studied the value of cod liver oil for promoting tissue growth. Already over 50 papers, which report the results of studies that involve more than 16,000 patients, have been published.

Cod Liver Oil for Burns

LOHR[3,6] has been a prominent worker in this field and an early paper reporting his treatment of extensive first, second and third degree burns, nearly 1,000 cases, with cod liver oil is abstracted: "The cod liver oil treatment of burns does not influence the primary shock but is remarkably effective in controlling the secondary infection of large areas. A rapid cleansing of the wound follows its application, and epithelization is stimulated to a degree not seen in any other form of treatment. It is superior to the tannic acid method in that it can be used on the face and in such difficult regions as the buttocks, scrotum and anus. The cod liver oil was used as a salve or in combination with the cod liver oil plaster of Paris cast. Attention is called to the fact that commercial cod liver oil is sterile. Under the influence of the oil and the rest secured by the cast, extensive and deep ulcerations in most difficult locations heal in the surprisingly short period of from eight to 14 days. The closed method of treatment with the cod liver oil plaster of Paris cast is particularly applicable in second degree burns of the extremities. Secretions may be copious in the first few days and make it advisable to replace the original cast. As a rule, the cast is kept on for two weeks. Third degree burns of the extremities are treated by enfolding the extremity in sterile towels thickly covered with the cod liver oil salve. After a few days a cast may be applied, especially when contractures about the joints are feared. The author was particularly impressed with the remarkable regeneration of epithelium over large surfaces, such as the entire back."

In his treatment of over 100 cases of second and third degree burns Lohr did not resort once to skin transplantation. Concerning this report the *Journal of the American Medical Association*[4] says: "In a bacteriologic study of various fats and oils, Lohr found that they are usually bacteria free even when not sterilized. Bacteria ordinarily encountered in infected wounds, streptococci, staphylococci and Bacillus coli, perish when introduced into cod liver oil . . . The oil in this salve permeates the tissues and causes a rapid liquefaction of the necrotic tissues, followed by a powerful stimulation of the growth, which affects all tissues, including the epithelium. Large areas fill with granulation tissue and these become covered with regenerated epithelium. The author did not resort once to skin transplantation during the last three and one-half years in which he has used this form of treatment. The inhibiting effect on the bacterial flora of wounds was likewise striking. The technic of treatment of fresh industrial wounds consists of the usual toilet of the wound with omission of suturing. A thick layer of the cod liver oil salve is laid on the wound surfaces and in the case of an extremity a plaster of Paris cast is applied over it. The cast is removed at the end of 14 days and the lesion is usually found to be healed . . . The treatment finds its application in chronic wounds, even if infected. Its effect is particularly striking in burns. The author has treated with this method 122 cases of second and third degree burns. The treatment was no more effective in preventing the early fatalities of burns than any other method. However, the late fatalities due to secondary infection were markedly reduced, more so than with the tannic acid method, because it is applicable in difficult localizations, such as the face, the buttocks and the anus. The regenerative effect on the epithelium was seen most strikingly in burns. Thus the author observed epithelization of an area of third degree burn 45 cm. square. The change of dressings is not painful, because the salve is removed in thick layers leaving the new granulation tissue intact. The author is of the opinion that the effects enumerated are due to the vitamin A and D content of the cod liver oil."

The excellent results obtained by Lohr in treating burns with cod liver oil ointment have been substantiated by Steel[5], who used liquid cod liver oil. The report of his method of treatment and his results have been summarized as follows: "Steel has obtained good results with cod liver oil in the treatment of burns. Lint heavily soaked in cod liver oil was applied widely over the part to be treated and covered with a dressing. The dressing is left in place and resoaked with cod liver oil every 24 hours, the lint not being taken from the skin surface until the end of 48 hours—an obvious advantage when the area to be treated is large.

When cases have not reacted previously to the ordinary dressings, it has been found that cod liver oil hastens recovery, and the speed with which an indolent area is transformed into one of healthy granulation is remarkable. Almost every patient has said that the first application of cod liver oil has given much greater ease than other dressings. The author also used crude cod liver oil as a dressing in indolent ulcers and deep abrasions, but always following the rule 'if there is pus, it must be let out.' It has been found of advantage in a great number of slow healing areas. After the removal of pus or gangrenous patches of skin, oil applied in the way described has induced rapid granulation of tissue previously indolent in leg ulcers and even in fistulas. One patient having a fistula had been in the hospital for 34 days under routine treatment and still showed a slight serous discharge. After the wound was packed for six days with cod liver oil, the patient was able to leave the hospital and needed to make only two outpatient attendances for the renewal of the dry dressings."

Plaster of Paris Casts

LOHR'S[3,6,7,8,9] method of treating burns with cod liver oil involves the use of plaster of Paris casts. Tammann[10] feels that the plaster casts are an important factor. Zuelzer[11] has reported his experiences with cod liver oil salve dressings in certain surgical conditions with and without the use of a cast. Bosse[12] questions the value of a cod liver oil bandage. Savchenko[13] and Horsch[14] also report their experiences with plaster casts in the cod liver oil treatment of wounds and skin lesions.

Lohr[9,6] has published two papers which report the results of treating acute and chronic osteomyelitis with cod liver oil. *Journal of the American Medical Association*[6] published the following concerning the second paper: "The periosteum is opened and the pus evacuated. The wound is filled with cod liver oil ointment, care being taken that it enters all corners. The wound is closed loosely, so that pus can escape readily. The filling with the mild ointment takes the place of rubber drains and tampons. The external wound is covered with a thick layer of ointment, and over this a plaster of Paris cast is applied. As a rule, the cast is left in place for two or even three weeks, but in case of excessive secretion from the wound it may be removed earlier. At the removal of the plaster cast, the wound is usually more or less healed. Roentgenoscopies that are made during the following period often reveal sequestrums. However, sequestrotomy should not be done too hastily, because particularly in young persons, considerable restoration of the bone takes place . . . The author says that in some cases he did not even hesitate to open the foot or knee joints. This procedure has no untoward effects. In summarizing the advantages of the cod liver oil and plaster cast treatment of osteomyelitis, the author stresses the painlessness, the fact that the frequent change of dressings is done away with and the fact that the general condition of the patients is favorable. He cites a case which indicates that even desperate cases are amenable to this treatment."

Cod Liver Oil and Cod Liver Oil Preparations

IT IS quite apparent from a review of the literature that the various investigators have individual preferences concerning the form in which cod liver oil should be used for treating burns, wounds and ulcers. Lohr[3,4,6,15,16,17] apparently prefers to use cod liver oil in the form of an ointment. Zuelzer[11], Thiel[18], Seiffert[19], Arendt[20], Lauber and Rochall[21], Jencio[22], Schaer[23], Horn and Sandor[24], Drigalski[25], Zoltan[26], Ingram[27] and Lucke[28] also report using cod liver oil ointments. Lohr[16] mixed cod liver oil with an inert base; Iost and Kochergin[29] combined cod liver oil, petroleum and Japanese wax; Knazovicky[30] used a mixture of cod liver oil and vaseline, and Buchheister[31] and Lucke[32] prepared a combination of cod liver oil and honey. On the other hand Steel[5], Tammann[10], Tumanskiy and Yatsevick[33], Tennent[34], Hayashi[35], Stevenson[36], Drigalski[37], Davson[38], Lohr[39], Rinne[40], Wartemann[41], Mennenga[42], Buchner[43], Lang[44] and Smirnor[45] refer to the use of cod liver oil.

Wounds, Ulcers and other Skin Lesions

IN VIEW of the gratifying results that were obtained when burns were treated with cod liver oil or cod liver oil ointments it is not surprising that cod liver oil was also used for wounds, over 15,000 cases[6], ulcers and other skin lesions. Lucke[28] used "cod liver oil ointment in numerous cases of paronychia, furuncle, carbuncle, abscesses and infected wounds, and found the treatment highly effective. He cites several cases, such as a second degree burn of the entire forearm, a trophic ulcer and an old fistula, in which the favorable effect of the cod liver oil ointment was especially noticeable. As a rule, the bandages were changed after 48 hours. This proved necessary, especially in the suppurating processes. The author recommends cod liver oil ointment for the minor surgery that is done by the general practitioner." Ingram[27], in a paper "Sepsis And The Skin," says: "The treatment of cellulitis and abscess formation does not call for comment from me except to recall the value, in the later stages, of general ultraviolet light therapy, which is not practised sufficiently. The very great value of cod liver oil to restore the balance between connective tissue and epithelium should be stressed; nothing favours the control of granulation tissue—probably by epithelial stimulation —and the efficient healing of granulating wounds (especially when tendons are exposed) as the application of this drug itself, or in glycerin, or in a simple ointment. In this connection also radiant heat therapy and occulsive, elastoplast bandages have a place." Zoltan[26] used cod liver oil for treating wounds. His results are summarized as "Treatment with vitamins in 297 cases showed advantages. An ointment containing both oleum jecoris aselli and carotene (vitamin A) dissolved in oils and irradiated ergosterol was used. Wounds generally healed better, more quickly and almost without any scars." A report from East Africa of the treatment of wounds with cod liver oil is of interest. Tennent[34] "has used cod liver oil in the treatment of a varied series of wounds. The method is comparatively painless; it is efficient, results in a great reduction in the number of dressings required, and is simple and cheap. The one disadvantage is the characteristic odor, but in none of the author's cases has the odor been an insuperable difficulty. He briefly refers to three of his most striking cases: a severe burn, an accidentally opened knee joint and a wound from a charge of shot at close range in the right buttock. Treatment with cod liver oil has given most

gratifying results, confirming those of Steel."

An extended study was made in Russia of the value of cod liver oil for treating chronic ulcers, burns, frostbites, amputation stumps and suppurating wounds. The *Journal of the American Medical Association*[29] summarized the results of this study as follows: "Iost and Kochergin report 263 cases in which cod liver oil treatment was used. Of these, 28 were chronic ulcers, 25 burns or frost bites, 19 severe trauma of the soft tissues of the extremities, 10 open amputation stumps, 150 fresh superficial wounds and 40 suppurating wounds. Cod liver oil was applied as a paste, made with 100 cc. of cod liver oil, 100 gm. of petrolatum, 1.5 cc. of a preparation containing vitamins, and 10 cc. of Japanese wax. In their experience a local application of cod liver oil was definitely beneficial in chronic ulceration, burns, frost bites and recent trauma of soft tissues. They believe the effect to be due to the abundant vitamin A and D content of the cod liver oil. Vitamin D possesses the property of stimulating the growth of granulations and of the epithelium. They consider it possible that there exists in the pathologic lesions or traumatized tissue a lack of vitamin due either to interrupted supply or to an increased demand for vitamins. The authors demonstrated in their bacteriologic studies that cod liver oil lowers the vitality of pus-producing bacteria. The application of cod liver oil to the wounds in the form of a paste is more efficient because the oil is kept in contact with all parts of the wound. Keeping the lesion at rest is an important element in the treatment, and is accomplished by fewer dressings or by immobilization in a plaster cast."

Cod Liver Oil Treatment of Eye Conditions

STEVENSON[36] obtained good results from treating burns, abrasions and ulcers of the eyes with liquid cod liver oil. He says: Case 1, "a very severe burn of the inner half of both right lids from a red hot rivet, which adhered to the patient's lids till he had reached the ground from the top of the 40-foot ladder on which he was working. I put in a drop of weak atropine solution, dressed the burn with a thick pad of gamgee soaked in ordinary cod liver oil covered with oiled silk and a bandage—in exactly four weeks the lids were filled up and healed. Both canaliculi had escaped destruction; there was no scarring; skin quite soft, but rather red and itching. He had no treatment except the oil and wiping away any mucus and the preliminary drop of atropine." Case 2 "had a splash of liquid caustic (used in cleaning hulls of ships) dropped into his right eye from a height of 30 feet damaging the conjunctiva of the upper lid, lower half of cornea and conjunctiva, and deeply burning the lower fornix. Very painful, much chemosis and swelling of lids. Oil was used freely and atropine for two days. The eye improved rapidly, but a symblepharon was forming in the lower lid. This was quite soft, very easily separated and did not recur. On December 7, five days after the accident, upper lid, cornea and conjunctiva were normal except for much redness in the lower fornix". Case 3, "a very deep linear abrasion, about 1 cm. wide, horizontally across two thirds of cornea, with ragged edges, and a smaller one less deep below it, caused by flying piece off head of rivet. Some particules of dirt were removed from the edges of the wound, drops of weak atropine and oil instilled and pad strapped on. Next day pad removed. Except for an almost invisible white line in cornea, no sign of any injury. The rapid healing of this case surprised us, it really was a very nasty wound." Case 4, "an old lady, aged 78 years, with dendritic ulcer of left eye. Much pain and photophobia. History of previous attacks, treated by carbolising, and lasting about two weeks. One instillation of oil relieved the pain in 10 minutes and stopped the lacrymation. Seen again a week later when except for two small rough spots the ulceration had disappeared and the inflammation and redness had entirely subsided. She had no other treatment." Case 5, "a child, aged five years, seen at Heswall Children's Hospital in October. Under treatment two years for coeliac disease and for about nine months for relapsing keratitis and ulcers of the left eye. Lids much swollen. Under treatment with slight temporary improvement and long periods of relapse. Oil tried as last resort three times daily. The ward sister reported the results as 'miraculous'. Child much improved in 24 hours and practically well in four days, but treatment continued for some weeks to clear up nebulae with apparent success."

Inhibiting Effect on Bacteria

IN ONE of his early papers Lohr[15] states that repeated examination of commercial non-sterilized cod liver oils showed them to be free from germs and that they inhibit the growth of such organisms as staphylococcus and streptococcus. Hence, in order to be assured of maximum vitimin value, Lohr recommends using non-sterilized cod liver oil or an ointment prepared with cod liver oil and vaseline for treating burns and any injuries involving loss of tissues, such as bullet wounds and crushed or cut hands and feet. He applies a thick layer of ointment to the injured area and allows it to remain untouched for two weeks. The author claims that cod liver oil has an extraordinary stimulating effect on mesenchymal and epithelial tissues. Several months later he says[4] that bacteria ordinarily encountered in infected wounds, streptococci, staphylococci and Bacillus coli perish when introduced into cod liver oil. In a subsequent paper Lohr and Treusch[17], in discussing the effect of cod liver oil on pyogenic bacteria, "point out that theoretically it would be better to use the natural cod liver oil in the treatment of wounds, because that would bring the greatest possible amount of vitamins A and D in direct contact with the wound tissues, constituting a parenteral vitamin therapy. Bacteriologic tests proved that cod liver oil is free from bacteria and that organisms introduced into it perish. This is true for the ordinary phyogenic bacteria and for Bacillus tuberculosis . . . As a result of their extensive clinical experience with cod liver oil salve and of their bacteriologic studies they conclude that cod liver oil therapy has a definite curative effect. The treatment should be looked on as a means of increasing the defense powers of the tissues." *The Journal of the American Medical Association*[46] has referred to the destructive action of cod liver oil on Bacillus coli, staphylococci and streptococci. They say: "In recent injuries, burns and phlegmonous inflammations, Lohr, of Magdeburg, employs cod liver oil ointment. Bacillus coli, staphylococci and streptococci are destroyed in

cod liver oil. He reported therefore on his plaster of Paris cod liver oil method in the treatment of acute and chronic osteomyelitis. After the periosteum has been split, a large plug of cod liver oil is inserted; a loose soft-part suture is applied, and then a plaster cast, which is left on for from two to three weeks. Opportunity is offered for the pus to flow off from under the bandage. In chronic cases, radical opening of the bone is indicated; then application of the plug of cod liver oil ointment and a plaster cast. Some of the advantages claimed for the method are that no painful changing of bandages is needed, and no abscesses or fistulas develop." As early as 1922 Campbell and Kieffer[47] reported that "cod liver oils have had a definite inhibitory and bactericidal action on virulent tubercle bacilli; cottonseed oil, used for control, has not inhibited the growth of the bacilli to the same marked degree, and has shown no bactericidal action; tubercle bacilli cultivated on the cottonseed oil media for six weeks were able to grow and produce tuberculosis, whereas tubercle bacilli cultivated on cod liver oil media for the same length of time were not able to grow when transplanted or to produce tuberculosis. Under the same circumstances, cod liver oil has also inhibited the growth of a *lepra bacillus,* an avirulent tubercle bacillus and the B. *typhosus.*" In their study of the value of cod liver oil for treating infected wounds "Tumanskiy and Yatsevich[33] found that the growth of streptococci in sterilized and non-sterilized cod liver oil ceases after one hour. The growth of staphylococci under the same conditions lasts six hours. Experiments showed that glycerin possesses the same bactericidal qualities as cod liver oil. The effect of adding sterile petrolatum to cod liver oil was to lower the bactericidal power of the latter, permitting the streptococci and staphylococci to grow 72 hours. The growth of streptococci and staphylococci in sterile petrolatum continued for 15 days. The authors confirmed the bactericidal qualities of cod liver oil in their experiments on guinea-pigs. The application of cod liver oil dressings in 53 patients with infected wounds demonstrated the effectiveness of this method. This was particularly effective in the treatment of granulating wounds of the soft tissues." As a result of the desire for data concerning the value of cod liver oil for treating wounds contaminated with soil and other materials Drigalski[37] studied the action of cod liver oil on bacterial mixtures, particularly soil bacteria and spore-forming organisms. He found that "cultures obtained by inoculating media with garden soil were inhibited by the addition of cod liver oil. This inhibition of bacterial growth affected particularly the gas- and spore-forming bacteria. The observed results explain the reputed beneficent effects of cod liver oil in wound antisepsis." In his paper " 'Biologic' Treatment of Local Pyogenic Infections" Lohr[60] describes the use of a cod liver oil salve and a stiff cod liver oil dressing for treating local pyogenic infection. He claims these produce a moderate congestion, which stimulates granulation, and as soon as the defect is filled in and the necrotic tissue is eliminated, epithelization takes place. Thus, from the biologic standpoint, this is a balanced equilibrium of exfoliation, conservation of vital tissue and regeneration. Lohr claims that he has never seen or heard of a case of general infection traceable to his biologic treatment.

Animal Experiments

IT HAS long been known that the oral administration of cod liver oil and other vitamin-rich materials produces beneficial changes in depleted tissues principally mucus membranes. Hence investigators questioned the possible effect of external administration of vitamin-containing products. In 1927 Hume, Lucas and Smith[48] found that "vitamin D in irradiated cholesterol can be absorbed from a small area of undamaged skin in sufficient amount to supply the needs of the animal." Amrhein[49] studied the absorption of vitamin D from the skin and concluded "that vitamin D can be absorbed from the skin. Also, the vehicle apparently has little or no effect in the absorption test, since the vitamin was absorbed from both vegetable and mineral oil bases . . . the presence of a small amount of vitamin A tends to produce more satisfactory results." Astrowe and Morgen[50] investigated the dermal absorption of vitamin D. They report: "It is readily seen from studies of the roentgenograms and from the macroscopic sections that white rats may be protected against experimental rickets by inunction with vitamin D . . . The same results are obtained by inunction with any of the available sources of vitamin D, natural or synthetic." "Lauber[51] observed in animal experiments that the local application of vitamin A as a rule produces no acceleration in the process of wound healing. In the case of concentrated application of the vitamin he even notices a slight retardation in the process of wound healing. Vitamin B, and vitamin C produce a slight retardation in wound healing, when given in comparatively large doses. Vitamin D produces a slight acceleration of the healing process when administered in a low concentration; when it is given in moderate doses, vitamin D has no effect on the healing of wounds, and when given in concentrated doses it even retards the healing process. The acceleration of the healing process is, however, never as convincing as following the oral administration of small doses of vitamin A. The oral administration of vitamin D has no effect whatever on the wound healing process. The author evaluates the use of vitamin ointments in the treatment of wounds. He deplores the lack of definite statements regarding their vitamin content and considers inadvisable the use of ointments with numerous components, because it is never certain whether the one or the other of the various components may not be harmful for the wound. He stresses the importance of determining the cause of a poor healing tendency of a wound, and shows that the treatment must be adapted to this cause. For instance, if diabetes mellitus or another metabolic disorder exists, it is necessary to treat this condition. If, on the other hand, a vitamin deficiency exists, the administration of vitamins will doubtless be helpful." Drigalski[25] studied the local vitamin action in cod liver oil ointments and concluded that "skin wounds in guinea pigs healed better on application of a cod liver oil ointment than on application of a vitamin-free ointment. The epithelial protective vitamin A was a factor in the better healing." Proto[52] "made experiments to ascertain the action of vitamin A, C and D on the healing of wounds in rabbits. The animals, both

those treated by the vitamins and the controls, were normally fed and kept in the same condition . . . The process of healing is not modified at all by vitamin C, whether administered by mouth or locally applied, but it is slightly modified by vitamins A and D given by mouth, and greatly and favorably modified by local application of these vitamins to the wounds, especially vitamin A. The time of healing is greatly lessened and the condition of the wounds is much better than in the controls." *The Journal of the American Medical Association*[53] commented upon some of the above-cited papers dealing with the dermal absorption of vitamin D as follows: "Thus it appears probable that vitamin D itself is absorbed directly from the skin . . . From the available data it appears probable, however, that the process of dermal absorption as compared with enteral absorption may not be an economical one . . . the amount employed daily in the latter experiments just described was 45 times the recognized effective oral dose."

Possible Role of Vitamins

SINCE it is well known that cod liver oil is a rich source of vitamins A and D and since there is considerable evidence that these vitamins can be absorbed by the tissues, in fact absorbed through the unbroken skin, a question has naturally arisen concerning the role played by vitamins A and D in the external use of cod liver oil. In discussing the external use of cod liver oil in treating wounds Lohr[16] describes the preparation of a cod liver oil ointment by combining cod liver oil and an inert base so that it would liquify at body temperature. Hence he obtains an intimate contact of the ointment and the wound. He reports excellent results, and he feels that the vitamin A and D content of cod liver oil is responsible for the stimulation of granulation and epithelial regeneration. Iost and Kochergin[29] feel that vitamins A and D are the active factor in the cod liver oil treatment. Hayashi[35] "believes that the accelerated healing power of cod liver oil when applied to infected wounds is mainly due to the effect of vitamins A and D and the lipoid contained in the oil. The effect should be attributed chiefly to the action of the lipoid. The effect of vitamins, which has heretofore been regarded as the chief efficacious property, is not really as remarkable as that of lipoid. The continuous application of cod liver oil for clinical treatment of wounds and bruises does not seem to cause any reactions." Lohr and Treusch[17] are convinced that vitamins A and D are the principal factors in the external use of cod liver oil. Horn and Sandor[54] published their conclusion concerning the local application of vitamin A and in a later paper Horn and Sandor[24] "employed an ointment, containing in each cubic centimeter 2,000 units of vitamin A, in the treatment of new injuries. They observed that the healing process is influenced favorably. The secondary infection is inhibited by the acceleration of the formation of granulations. In the treatment of suppurating wounds, the ointment furnishes a protective layer between bandage and wound surface. The discharge of the secretion of the wound is facilitated. The formation of granulations is greatly increased, the disintegration of necrotic portions is promoted and the entire healing process is considerably accelerated." Kemmler[55] has also discussed the influence of vitamin D on wound healing. Subsequently Sandor[56] submitted additional evidence that vitamin A is the factor in the external use of cod liver oil. He says: "As a result of several years' experience, I am nevertheless of the opinion—and one shared by my collaborators—that even more successful results have been obtained ever since we started applying vitamin A to the wound, in addition to dressing it and making it comfortable. Serious injuries of the hand, sinews, joints, and head treated by us heal as a continuous process, with no considerable suppuration, it being mostly primary—the vitamin applied no doubt plays a part in this. In purulent and infected wounds, rapid cleansing and prompt and satisfactory granulation are remarkable, and another excellent feature is that the dressing can be changed less frequently and without causing so much pain . . . It may be worth mentioning here that in two cases of tuberculosis of the bladder I was able, after nephrectomy, to record rapid improvement followed by complete cure; and that in one case of spinal caries with a burrowing abscess, the dysuria and the pyuria (in the urine positive for Koch's bacillus) were greatly improved after eight to 10 days' instillation of 50 ccm. of vulnovitan oil, without any other local treatment. Two cases of cystitis with prostatic enlargement, however, showed no improvement at all under similar treatment . . . Injuries due to burn and also changes in the cornea and conjunctiva by a variety of acid substances may be mentioned as a very special group for the treatment of which the application of vulnovitan is perhaps the most valuable of all known methods. Neither the ointment nor the oil is found to irritate the eye, and apart from a few hypersensitive cases, the patients experience neither pain nor local irritation. Conclusions: In the treatment of injuries affecting a very large area, special reference being here made to the requirements of war surgery, I consider that the method which consists in excising the wound, filling it with pure vitamin A oil or ointment (vulnovitan), and immediately applying a plaster of Paris dressing does constitute a real advance. In septic surgery cases, the use of vulnovitan accelerates the healing process and simplifies the treatment." However, even though Zoltan[26], Drigalski[25], Proto[52], Horn and Sandor[24] and Sandor[56] feel that vitamin A is the principal factor in the cod liver oil treatment, Davson[38] is equally positive that vitamin A is not the important factor. He states: "The essential features of the tissue response to cod liver oil are, first, a considerable polymorphonuclear infiltration, then active capillary congestion with infiltration by plasma cells, monocytes, and fibroblasts, the latter deeply penetrating the tissues; with the fibroblast proliferation there is associated capillary proliferation. Thus cod liver oil stimulates the reparative processes involved in the healing of wounds, and is a far more potent stimulus than either liquid paraffin or olive oil. Since the development of a healthy vascular granulation tissue is an essential preliminary to the epithelialisation of wounds that have not healed by first intention, the accelerated healing claimed by the clinical workers may be explained by the response of the tissues to the direct application of cod liver oil . . . In conclusion, it may be stated that the study of the histological reaction to cod liver oil tends to support the view that the appli-

cation of this oil to wound surfaces will promote the processes of repair and healing, but the results obtained by employing oils of varying vitamin A content do not support the assuption of Lohr, Horn and Sandor, and of Steel, that the vitamin A content is the responsible factor . . . The cellular stimulation produced by cod liver oil appears to be of a nature to facilitate the process of healing of wounds." This difference of opinions concerning the role of vitamins in the external use of cod liver oil is nicely summarized in *The Lancet*[57]: "Further experience seems to bave confirmed the early opinion that granulation is encouraged and the wound heals more quickly under the application of a cod liver oil dressing. How the effect is brought about is not yet clear. It is tempting to accept the hypothesis that the results are due to vitamin A contained in the oil, but it is not evident what part the vitamin plays. The tissues react differently to animal oils than to vegetable or mineral products, cellular activity being promoted to a much greater degree by the former. An attempt to elucidate some of these problems is described in a paper by Dr. Davson published elsewhere in this issue. He studied the healing of wounds in the rabbit's ear, and came to the conclusion that the stimulating property of cod liver oil resides in other constituents than vitamin A. On the other hand, Dr. Sandor, whose observations are also recorded in this issue, concludes from his clinical experience that it is vitamin A alone which expedites the reparative process." Contrasted with these views Pyke[58] feels that the value of the cod liver oil treatment resides in some factor other than the vitamin content. He says: "The reason for the virtue of cod liver oil is by no means clear. At present it appears to be doubtful whether vitamins play any part. I should like to suggest that rancidity itself may be the therapeutic agent. Rancidity is commonly accompanied by the development of 'active oxygen'."

It is evident from this review that further study and experimentation will be required to answer the questions that have arisen regarding a number of phases of the external use of cod liver oil for treating burns, wounds, ulcers and skin lesions. For the present, however, this method has been aptly summarized in editorial comments[59] concerning Lohr's investigations. He "began to apply the crude oil to granulating surfaces, and noted the changes which went on underneath it. He was already aware that, like other oils, cod liver oil is practically sterile and has some bactericidal action on the common pyogenic organisms. The oil proving too mobile for use alone he combined it with some indifferent fat to make an application of the right consistence, which was found rapidly to permeate granulation tissue forming an emulsion with its secretion. Under this layer he discovered that bacterial growth was hindered and bacterial toxins rendered harmless. The practical result of applying this cod liver oil salve to a mass of granulations is to change a pale oozing surface covered with detritus into the clean ruddy picture of healing . . . In recent injuries of the fingers and burns of the second degree the immediate application of the occlusive oil bandage results in rapid healing without need of transplantation of skin. During the last three and a half years in the Altstadt no burnt surface has been sown with transplants, even though the epithelium has been destroyed over a surface as large as the back, and one doubts whether such success has attended any other method. Amputation stumps and the open wounds left after removal of a breast cancer with the diathermic knife are equally suited for the treatment, which can also be applied to dirty brain wounds and accidental bedsores. An additional claim for the treatment is that it is practically painless, and anyone who accompanies Lohr on a round through the wards can satisfy himself that this is the case . . . Remarkable success is claimed in acute osteomyelitis, which Lohr treats with free incision down to the periosteum combined with drilling or chiselling of the bone. The whole wound is then filled up with the cod liver oil salve, the edges being brought loosely together with two or three stitches. No drain of any kind is inserted, the oil serving to keep the wound open until it has healed from the bottom. The first plaster bandage is left on for a fortnight and as a rule no sequester is then found."

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Tumors of the Bladder

—*As Related to Industry*—

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THE so-called anilin tumors of the bladder present a problem to industrial medicine which is of great moment economically as well as medically.*

Rehn[1] in 1895 first demonstrated the relationship of anilin to these tumors and the publication of his work aroused a storm of controversy which has not yet been entirely settled. Rehn's discovery of anilin tumors, while not generally accepted until about 1905, gave impetus to a great deal of investigative effort in an attempt to determine just how carcinogenetic substances came to act. The urine of carcinomatous patients was exhaustively studied as were the intermediate products of dye manufacturers. It was conceded by most observers that the toxic agent of the anilin tumor gains access to the body chiefly by inhalation and is absorbed through the respiratory tract.

Previous to 1914 practically all of the dyes were manufactured in Germany. It was not until the outbreak of the war that it became necessary for other countries to manufacture their own dyes. Hence the majority of the work on the pathogenesis of anilin tumors has been done in Germany.

Rehn in his original article found three cases of bladder tumor among 45 men engaged in the preparation of dye, and believed that this condition was caused by the absorption of chemical compounds which were excreted in the urine.

While agreeing with German investigators that the respiratory tract is the chief means of introduction of carcinogenetic substances in the form of gas and dust, Gehrmann[2] believes that the skin and gastro-intestinal tract play some part as a means of access for the toxic material. Later workers, however, notably Simon[3], Cook and Kennaway and the urological division of the medical clinic of the Du Pont de Nemours Company[4], have suggested that the toxic agent may not be carried by the urine but by the blood stream. Ferguson, in an introduction to a symposium on anilin tumors of the bladder[5] states:

"If it be accepted that the theory of the elimination of a carcinogenetic agent in the urine acting directly on the mucus membrane is not proved and that the circulation of such an agent through the blood is a possibility, then the disputed questions of the implantation of tumors from one part of the bladder to another become answerable. Implantation cancer by direct contact or otherwise is practically unknown in other locations of the body and certainly never occurs through the unbroken mucus membrane or skin. It is the belief of most continental workers, and certainly of our Wilmington colleagues, that the new tumors occuring in these workers are actually new and not implants. We believe the disease to be a generalized lesion of the entire bladder mucosa."

Prolonged exposure to aniline, alpha and beta napthylanine and benzidine are responsible for the development of tumors in men engaged in handling these chemicals. This assumption is based on the incidence of tumors among these individuals and is not conclusive. With two of these substances, namely beta-napthylanine and aniline, Pearlmann and Stachler[6] were able to produce tumors by daily subcutaneous injections. Leuenberger[9] in 1912, found that about 50% of all bladder tumors treated at Basle Clinic were in dye workers and the incidence was 33% greater than in non-dye workers. In an article published in 1931, Henry, Kennaway and Kennaway[10] found that in eight out of 10 occupations associated with exposure to coal gas, tar, pitch and soot the incidence of bladder carcinoma was higher than that found in the general male population, and in five out of 10 occupations it was one and a half to four times as high. High incidence of carcinoma was also noted among tanners, leather dressers, dyers and dye mixers and painters. Since 1925 tumors of the bladder in dye workers have been compensable in Germany. Under present laws any disease directly traceable to a workman's occupation is compensable in Illinois. The Federal government, I believe, made the first provision for compensation of injured employees, and in 1911 the states began the establishment of laws dealing with industrial injuries. Since that time these laws have been broadened and enlarged until seven states—Illinois, California, Connecticut, Massachusettes, North Dakota, Missouri and Wisconsin—have blanket legislation. This provides compensation for any disease which disables the employee and arises from his occupation. The present day economic and political attitude toward social security, unions and regimentation suggests that these laws may be broadened.

PROBABLY the first report of an anilin tumor in this country, recognized as such and reported as being associated with the man's occupation, was that of a man employed in the nitro-benzidine department of the dye works in Wilmington, Delaware. As a result of this case an investigation was instituted and routine examination adopted.

Our knowledge of the etiological factors present in cases of carcinoma of the bladder is even at present rather vague, compared to other diseases with a high mortality. Because it has been shown that industry may be responsible for such a condi-

* Given before the Central States Society of Industrial Medicine and Surgery, Cook County Hospital, Chicago, December 4, 1936.

tion, surgeons and investigators employed by industrial concerns have made a great step forward in combating this scourge. We have examined the records of 108 cases of bladder tumor of unknown etiology seen on the urological service at St. Luke's Hospital in Chicago during the past six years, and have attempted to compare these tumors with those reported as anilin tumors. In this series we found that 52, or nearly 50%, were employed in industry but in none of these could any history of exposure to anilin or alpha and beta napthylanine or benzidine be determined.

These individuals came from all walks of life, but their early history as to occupation could not be determined.

The pathological reports in all cases did not seem to vary from those reported as anilin tumors. The type of tumor ranged from the so-called benign papilloma to the severe rapidly infiltrative and ulcerative type of carcinoma.

In the series of anilin tumors reported by Gay, three were classed as carcinoma; four as papillary carcinoma; and one as a papilloma invaded by a carcinoma; seven as papilloma; and two cases presented papilloma and papillary carcinoma.

Gehrmann[2] states that, of 63 cases reported, the incidence of carcinoma was 38. While in an analysis of 124 German cases the incidence of carcinoma was twice that of papilloma. In this series three cases were papilloma; 89 were carcinoma, and 15 were at one time fulgurated as papilloma but later proved to be carcinoma.

As medical students we were taught that the commonest cause of painless hematuria was a tumor of the bladder. While we are not disagreeing with that statement, practically all the cases examined revealed an accompanying frequency, urgency, burning and pain. The anilin tumors described however did not present such classic symptoms, but it must be remembered that the majority of these tumors were discovered upon routine cystoscopy and were diagnosed early. In our series, excluding cases that had had previous cystoscopy or treatment and also those diagnosed as inoperable, the average duration of symptoms was 17 weeks; the longest 76 weeks, the shortest two weeks before specimens were obtained and therapy instituted.

The location of a tumor of the bladder has long been considered in attempting to determine the mode of entrance of the carcinogenetic factor. Fifty-six of the tumors of this series were found on the trigone and about the internal urethral orifices; 20 on the lateral walls about the ureteral orifices; 19 in the vault; 10 on the posterior wall; four involved the entire bladder, and one was located in a diverticulum. There were 18 women in this series, with an average age of 55 years. Tumors among the men were most common between the ages of 51 and 70, the largest group (25) being between the ages of 56 and 60. The youngest was a man of 32 with a papilloma. One man of 38 had an extensive carcinoma, as did also one man of 86. Among anilin tumors 11 involved the trigone while six attacked the bladder walls.

BOND[11], in a very complete review of 118 cases of carcinoma of the urinary bladder, states that the results of treatment vary markedly in the reports of various authors. Claims in terms of five-year cures vary from 12% to as high as 45%. The best results are claimed by those who regard all bladder tumors as malignant or potentially malignant, and the poorest by those who regard carcinoma as definitely infiltrative growths.

The three papilloma were fulgurated through a cystoscope with no record of recurrence. The method of treatment of carcinoma of the bladder is represented by two major schools. Barringer, Keyes and others feel that in these the best results are obtained by the use of radium either through the cystoscope or implantation through the open bladder. Others feel that resection and surgical diathermy is the therapy of choice. Both, I believe, favor resection when it can be accomplished early and include a wide area. The men at St. Lukes would seem to adhere to the latter school. Resection and surgical diathermy were carried out in 47 cases; resection in 11; fulguration in eight, five of which were papillary carcinoma; and resection and radium in two. Seven were considered inoperable or had a cystotomy preformed for drainage; 15 were fulgurated but were later resected. An attempt was made to determine the percentage of three-year cures, but there was not sufficient response to include this data. However our best results were obtained in those which were diagnosed early.

Parmenter and Lentenegger[12] in a recent article state:

"Fulguration seems to be curative in cases of benign papilloma. Malignant papilloma did better in a combination of fulguration and radium. Resection, unless wide and complete, showed poor results."

TREATMENT of carcinoma of the bladder as related to industry falls naturally into two phases.

The first is the preventive phase. Since it has been shown that the human body absorbs products of a carcinogenetic nature, industry would do well to combat the cause at its source. Dust and fumes must be controlled by adequate exhaust ventilation, and the workman's skin should be thoroughly protected.

Cleanliness is next to Godliness, and all employees coming in contact with carcinogenetic agents should be so informed. In the hiring of new employees a careful history as to familial carcinoma and previous occupation is important. Any history of urinary or venereal disease would be contra-indication to employment. All men, before employment, should have a visual examination of the urethra and bladder. Routine cystoscopy of men so employed is the only positive method of early diagnosis, and those presenting an injected posterior urethra and trigone, even in the presence of a low grade prostato-vesiculitis, should be carefully watched if not withdrawn from this type of work.

In other words, any irritation of the bladder mucosa from some source not easily explainable should be carefully watched.

Early diagnosis predestines early treatment, and it has been shown that early treatment gives the best results in tumor of the bladder.

The type of operative interference advised is that which has shown the best results in the operator's hands.

IT IS apparent from the reports published by investigators and clinicians working in the dye industry that certain causative agents are responsible for the production of carcinoma of the bladder in workmen exposed over a long period of time to these agents. The German government has made such a condition compensable. These tumors do not present a pathological or clinical picture which differs materially from that shown by tumors occurring in individuals whose working conditions are unknown. Two important considerations arise therefrom:

First, that in industry, wherever there may be a chance of exposure to the products which have been shown to be an etiological factor in the production of bladder tumor, plant and medical prophylaxis should be thoroughly carried out. We agree with the Wilmington group that early and frequent cystoscopy is of prime importance in early recognition and treatment of the condition. Symptoms may not arise until the tumor has progressed to such a stage that complete cure is impossible.

While it is not definitely proved that anilin, alpha and beta napthylanine and benzidine are the direct cause, it is certainly of the greatest importance that the incidence of bladder tumor is higher among this class of workmen than any other group.

Second, it raises the question whether or not there are other irritating chemicals or products of industry which may also be responsible for such a condition.

It behooves medicine, therefore, and industrial medicine in particular, because of recent legislation, to investigate and protect both employer and employee by adequate examination and plant control.

It is evident that industrial medicine has made great progress experimentally and clinically in combating a pathological process which still menaces human life. Because of the incidence of bladder tumor among plant workmen and the placing of the responsibility for that condition by governmental forces, industrial medicine has had the necessary stimulant to promote experimental and clinical investigation and advise phophylactic measures.

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The Occupational Disease Situation

—Past, Present and Future—

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IT HAS become somewhat of a traditional occurrence that I should speak to you at your December meeting each year.* This is now the fifth time I have had the honor and privilege of appearing before you and speaking to you on some phase of occupational diseases. The others were in the years 1931, 1933, 1934, and 1935.

It has also been a custom in the recent political campaign to review one's experience in terms of where he has been, and what he has seen and heard. Briefly, I shall refer to only two episodes in my experience; one being that I have traveled since speaking to you last, over 23,000 miles by rail, covering 10 different states and visiting 19 different cities in my work of industrial hygiene and occupational diseases. The other relates to my experience just last week, when in one of the principal eastern cities I addressed the claims men, inspectors, engineers and underwriters of a large casualty insurance company, lecturing to them and discussing their occupational disease problems with them for a period of two days and one evening. These two experiences surely show the trend in relation to the interest in occupational disease problems.

You will recall in your high school history that this study was divided into several parts, one pertaining to ancient history, one to medieval history and another one to modern history.

It will be rather convenient in presenting this purview of the occupational disease situation to make comparisons between these kinds of history and the periods of evolution through which we have passed with regard to occupational disease conceptions.

The Period of Ancient History

OUR past experiences may well be aptly compared to the period of ancient history, and this period may also well be called the stage of guesswork and hysteria. Your interest and the interest of most people has been in the spectacular, and, in fact, this has been the basis for compensation laws in regard to mechanical injuries. There is nothing spectacular about occupational disease in the main, and so your interest has been stimulated in laws or in problems because people have continued to be crippled and killed by mechanical forces. There is no such direct appeal in respect of occupational disease.

Then along came the depression, with the effect of producing a number of spurious cases which resulted in a great burden being placed upon industry in regard to the economic situation.

In addition to these factors, there has been a lack of general knowledge and of trained men in connection with occupational disease difficulties.

All of these factors have resulted in the production of bogies and unrest—hence the reason for applying the name to this period of evolution in

* Abstract of a talk delivered before the Engineering Division of the Chicago Safety Council, December 17, 1936.

occupational diseases as the stage of guesswork and hysteria.

The Period of Medieval History

OUR present experience may be likened to the period of medieval history. It is now believed that we have come somewhat past the bogie stage, with a swing to the factual, and this stage may be termed the stage of reality.

As evidence of the swing to the factual, last year occupational disease compensation legislation was introduced in more than 40 states, and as a result of this activity, a number of states have actually passed laws, including Illinois.

In this stage when emphasis will be placed upon factual evidence, plant surveys and studies have become more popular; examinations including x-rays and clinical laboratory tests have now come into use more widely. These devices will be used more and more in the future to get facts.

The Period of Modern History

THE future, which overlaps somewhat upon the present and includes developments in the immediate offing, may be likened to the period of modern history. This may be called the stage of progress. I predict that compensation for occupational disease disability will be general in the United States within the next five years—that physical examinations will become universal within the next 10 years, and along with this, will be an increased use of surveys and studies of industrial environment.

As a practical outline of important sources of difficulty relating to occupational diseases, let us merely mention the following:

1. DUST (silica and asbestos-containing dusts).
2. METALS (lead — cadmium—chromium—mercury—thallium).
3. GASES (carbon monoxide—sulphur dioxide—hydrogen sulphide—arsine—the nitrous group—cyanogen compounds).
4. VAPORS and SOLVENTS (benzol and its homologues — the chlorinated hydrocarbons — and others).
5. SKIN IRRITANTS (soaps and cleansing powders —dyes—oils and greases—dusts and powders—solvents—agents of infection).

This is not in any way to be considered an exhaustive list, but a number of the "high points" of importance have been picked as the chief possibilities or probabilities relating to occupational disease and these have been mentioned.

It is significant in this connection that when the U. S. Public Health Service made a cross-sectional survey of industries and published its results in the year 1934, it was discovered that in order of frequency the chief exposures in industry were as follows: inorganic dusts—carbon monoxide—and lead. There are of course a number of others, but these are the chief types of exposure encountered in American industry and those which are likely to give difficulty. It is well to remember that this cross-sectional survey was made in 10 different industries, embracing 615 plants, and involving 28,000 employees.

What to Do?

IT HAS been well said that the best criterion of an occupational disease hazard is the occurrence of occupational disease; but none of us can afford to wait, I take it, for disease to occur.

At this point it might be well to make a distinction between the two words *exposure* and *hazard*—simply because, as the U. S. Public Health Service has pointed out, when a man is exposed to lead, carbon monoxide, or inorganic dusts, it does not mean that he is exposed to a *hazard*. More must be known than the mere *fact of exposure;* we must know the quality and quantity of exposure and then, when compared with criteria which have already been established in the production of disease, we shall be able to say whether or not a *real hazard* exists. Remember that a hazard is always an exposure—an exposure is not always a hazard.

Here are some concrete suggestions which are boiled down to very brief expressions, but which contain the real essence of prevention of occupational disease:

1. Find out the *exposure* and the *hazard* in your plants.
2. Examine your men (before employment—during employment on hazardous jobs—and at the time of discontinuance of employment). The examinations will be different for different types of exposure—obviously an examination for a dust occupation will not suffice for a lead occupation.
3. Correlate cause and effect factors from the information gained by scientific study of the industrial environment and the medical data accruing from examinations and laboratory tests.
4. Control or eliminate the hazard, or furnish adequate protection for your men.

Another way of stating the foregoing suggestions forcibly is as follows:

Management must know its men, materials, methods, and machines.

In summary, the occupational disease situation has become a national question—it involves socio-economic problems of tremendous significance—but it presents difficulties no greater than any other industrial problem if the same amounts of time and money and quality of brains are used as have been applied in the past to comparable industrial situations.

Trauma

—*As a Cause of Malignant Tumor*—

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FREQUENTLY in compensation cases, and even occasionally in private practice, the question arises as to whether an injury may be the cause of cancer.* Because of publicity and education of the public regarding cancer, the patient's fear of its development following an injury seems to be quite natural. Attorneys, in looking for possible complications of injuries so that they may increase the amount of compensation for their clients, not infrequently state that the injury may predispose the plaintiff to cancer. It is an extremely difficult subject to evaluate.

The following discussion is an effort to collect the thoughts of leading investigators on the subject. It is to be definitely understood that this discussion considers only the effects of a single in-

* Presented before the Congress of Railway Surgeons; meeting of the Association of Surgeons of the Chicago & North Western Railway, and the Burlington Surgeons, November 6, 1936.

jury. Nothing that is said will apply to chronic irritation, to known carcinogenetic agents, or to burns. Metastatic tumors are not discussed.

Compensation decisions are often made without regard to the scientific aspects of the question at issue. Both legal and medical opinions are often expressed without a clear conception of the nature of the evidence or an accurate knowledge of the facts upon which the opinions are made.

Askanazy[1] stated that the literature dealing with the subject was only a "collection of anecdotes," and that it contained many highly uncritical studies.

Those interested in this question are referred to the excellent reviews of the literature by Ophuls[2] in 1921, and Knox[3] in 1929, and the quite thorough discussion by Ewing[4] in 1935.

Historical

THE relationship of trauma to cancer was discussed by Lowenthal[5], from Bollinger's Laboratory, at Munich, in 1895. From 800 cases in the pathological Institute at Munich from 1870 to 1895 there was a history of acute trauma in 358. So little critical analysis was made that this article probably proved nothing.

Schimmelbusch[6] felt that conclusions based upon complications of case histories were absolutely unscientific and not of great value. He stated that scientific matters could not be based upon untrustworthy and unreliable evidence, and that on this subject all the evidence was essentially unreliable.

In 1898 Coley[7] studied the role of injury in the development of sarcoma. In 170 cases there was a history of trauma in 46 (27%). These cases, again, were not thoroughly studied.

Owing to the growing interest in this subject it was thoroughly discussed at the Second International Conference on Cancer at Paris in 1910. At this time Theim[8] laid down five postulates which had to be fulfilled before trauma should be considered the cause for the subsequent development of cancer. These were as follows:

1. The occurrence of the trauma must be proved.
2. The trauma must have been severe enough to appear effective.
3. The growth must appear at the place likely to have been injured by the trauma.
4. It must be reasonably certain that the traumatized part was normal before the accident.
5. The time elapsing between the trauma and the appearance of the tumor must agree with our scientific experience on the rapidity of the development of the particular kind of tumor under consideration. It must not be less than a few weeks or over two years unless there are symptoms which bridge over the intervening period.

Of these rules, No. 4, as to the certainty that the traumatized part was normal before the accident, is the hardest to prove.

Lowenstein,[9] in 1910, in a long monograph on the subject, analyzed from the literature 261 cases of malignant tumors—seven from Heidelburg and three from Frankfurt, according to the histories, were considered traumatic in origin. This paper was superior to previous ones inasmuch as an attempt was made to apply critical standards to the history, and the author appreciated the need of scientific methods in making conclusions. He presented tables giving clearly the lapse of time between the injury and the development of the tumor. He included only those in which the injury was described as being at the exact site of the subsequent tumor.

Brosch[10] felt that a single trauma could not cause a tumor, but that the early productive and reparative changes observed in scars were essential forerunners of the neoplastic process. This accounted for the inability of experimenting pathologists to produce tumors in normal tissues.

Goebel[11] also stated that a single injury never caused a malignant tumor, but that chronic irritation, repeated injuries and scar tissue might have done so.

Oberndorfer[12] also believed that some underlying predisposition must be present in addition to trauma.

Virchow[13], while admitting the fact that the influence of traumas could not be dogmatically denied, required that there must be some as yet unknown predisposing factor in the patient, and also that the trauma must have been implanted on pathological tissues.

Ribbert[14] opposed the theory that a trauma could cause a tumor, but admitted that the possibility must be conceded. He had never seen a clearly demonstrated case.

Mock and Ellis[15] reviewed the literature. They quoted Bloodgood[16] as saying, in an address before the Ninth Annual Convention of the International Association of Industrial Accident Boards and Commissions, at Baltimore, October 11, 1922: "In my own group of now 1,000 bone tumors, of which perhaps 400 are sarcoma, I have but two cases in which directly after the injury an x-ray was taken showing a negative bone." Mock and Ellis reported nine cases which they felt fulfilled the postulates. Of these, two were metastatic tumors, one a teratoma of the testis following several injuries, and one a sarcoma of the bone in which the sarcoma was likely existing before the injury. In conclusion they said: "There is no justification for assigning trauma as the etiologic factor in any particular case, unless this can be proved with scientific accuracy. In the great majority of cases commonly reported as the result of trauma, such an etiology cannot be scientifically established."

McKendrick[17] asserted that there is no authentic case quoted in medical literature where it can be proved beyond a doubt that fracture caused sarcoma.

Only a few of the many authorities have been quoted. However, more of such reports seem unnecessary, as they are all very indefinite and not based upon scientific data.

War Records

A GROUP of authorities have studied war records in regard to this matter. The general impression was that no greater percentage of tumors could be observed in the war veterans than in civilians. In the period since the war no increase in the incidence of tumors has been found. The age of the soldiers was the age of people ordinarily suffering from sarcoma. In studying a large number from the western front, Pick[18] was able to find only two cases of sarcoma which he could even suspect of arising from war injuries. In the large number of cases studied this would be no more than would be found in any similar age group of people.

The French Association for the Study of Cancer investigated this in 1918 in the light of experience obtained during the war. Some of the leading pathologists and clinicians discussed the problem and practically all, with the exception of Berard[19], thought that trauma had nothing to do with the appearance of a tumor. Berard had previously given his opinion at the Paris Conference in 1910.

Lowenstein, in his military service from 1889 to 1917, found no increase in the per cent of sarcoma. In the Prussian Army, from which he obtained his figures, he found only one case of post-traumatic tumor in 15,000 cases.

Forgue[20] showed that the regional distribution and age distribution in 536 cases of cancer were practically proportional to the like distribution in the male population not in the service.

Von Hansemann[21] stated that not only was there no increase in the number of tumors following the war, but also no new types appeared.

The Element of Chance

FROM the records of the New York State Industrial Compensation Bureau, Lewy[22] found 37 cases of malignant tumors among 26,389 injured persons. In few of these cases could the traumatic origin be established as reasonable. This ratio was about one to 700, or approximately that of the general population at the age of 50.

Ewing stated that French medicolegal experts reported the occurrence of as low as five or six traumatic tumors among 100,000 injuries.

Knox estimated that, as the average life of a patient with cancer had been computed to be about two years, there should be in the population as a whole some 250 persons in each 100,000 who had cancer in some stage, in addition to those who were to die within the year and are so recorded. In other words, besides those evidently dying of the disease, one person in 400 of the whole population might have cancer in some stage of development. As sarcoma formed about one-tenth of the total of malignant tumors, one person in 4,000 might have an unrecognized sarcoma. He stated that the possibility of a trauma calling attention to a tumor already present must be recognized in any study of the relationship between injury and the production of a sarcoma.

Williams[23] showed that men were more subject than women to trauma, especially to the more severe injuries such as fractures, sprains and dislocations. In his material, however, men had fewer cases of cancer than women, in the proportion of one to 1.7. Knox, however, in commenting on this, stated that the difference in these figures was due to the frequency of those occurring in internal organs. Therefore, it is not as effective an argument as first appears.

Ewing's Postulates

BASED somewhat on the postulates of Theim, Ewing in 1935 gave us five requirements which must be fulfilled in considering trauma as the cause of cancer. These were:

1. The authenticity and adequacy of the trauma.
2. The previous integrity of the wounded part.
3. The tumor must arise at the point of the injury.
4. A reasonable time limit must be observed between the injury and the appearance of the tumor.
5. The positive diagnosis of the presence and nature of the tumor is essential.

THE AUTHENTICITY AND ADEQUACY OF THE TRAUMA: The statement of the patient that an injury occurred is relatively unimportant. Most of us get bumped at times and yet do not develop a malignant tumor. Therefore, in inquiring into trauma, a very high proportion of patients can recall some type of injury. An individual's evidence should be corroborated by an eyewitness or better by immediate discovery of signs of injury by an intelligent layman or physician. The exclusion of a previous injury of the same sort is necessary, otherwise the condition amounts to chronic irritation and not trauma in the strict sense. Ewing gave the example of shop women frequently bumping their breasts in pulling out rolls of goods. This type of thing is more properly called occupational disease than traumatic cancer.

Ewing also stated: "The trauma must be adequate to produce some alteration in the structure of the tissue, and the least effect it can give is rupture of small blood vessels with hemorrhage and discoloration of the skin. It should also be capable of exciting some regenerative process, otherwise it is difficult to conceive how it can excite excessive and abnormal proliferation of cells. Much importance attaches to the character of the wound, and of the instrument causing it. Clean surgical incisions never lead to cancer. The presence of retained blood clot or fragments of necrosing tissue provides conditions in which abnormal reactions may conceivably occur. When foreign bodies or irritating chemicals, such as acids, tar, wood, etc., are carried into a wound, healing is delayed and atypical results may be expected. There are many reports of cancer of the skin following wounds of this character. No doubt many of these are coincidences, while others represent the combined result of injury and previous alteration of the skin. In all such cases one must inquire whether the patient has been exposed to tar, or petroleum products, or has had a course of arsenic therapy, or suffers from multiple keratoses."

THE PREVIOUS INTEGRITY OF THE WOUNDED PART: Most patients who develop cancer assert rightly that they had been in excellent health. The majority of the cancer cases associate the beginning of the trouble with a trivial incident, the most satisfying of which is an injury. Usually the only proof of previous integrity is the evidence of a competent medical examination. Adherence to this criterion would exclude many of the cases of supposed traumatic cancer. Ewing stated that the presence of marked cystic disease in one breast raises the presumption that cancer in the other breast arose on the basis of cystic disease. He also thought that many cases of supposed traumatic sarcoma of the bones would be rejected when an immediate radiograph showed that the tumor was well established at the time of the injury. In concluding these statements he remarked: "So strong is the evidence against the purely traumatic origin of most cancers that one must assume the attitude that a supposed traumatic cancer arises not in normal but in previously altered tissues. Trauma reveals more malignant tumors that it causes."

THE TUMOR MUST ARISE AT THE POINT OF INJURY: Ewing stated: "Any reasonable theory of the traumatic origin of a tumor must assume that the

tumor develops in tissues actually altered in structure by the trauma and not from some wild transmitted force leading to intangible nutritional disturbances of which we know nothing. Such alteration in structure can only be produced at the exact point of the injury or within narrow limits. A blow on the knee cannot be assumed to be connected with a tumor arising in the hip, and an injury of the nipple cannot be responsible for a cancer arising in the upper outer quadrant of the breast. Lesions limited to the skin may not necessarily affect tissues deep beneath the skin.

"On the other hand, there may be severe injury to deep organs without obvious damage to the skin, but the extent to which such deep effects may be expected will depend on many circumstances and becomes a matter of careful clinical judgment. In skull injuries the principle of contrecoup is of importance but difficult to evaluate. I have not found evidence of injuries to the cranium that have been connected with epithelial tumors of the sinuses or nares.

"It is difficult to conceive how a general concussion of the body can give rise to a malignant tumor at a particular point in which no structural damage can be demonstrated."

A Reasonable Time Limit Must Be Observed Between the Injury and Appearance of the Tumor: Ewing felt that it was difficult to establish any definite limits within which a tumor may be ascribed to trauma. With very rare exceptions there must be three or four weeks or more before there is any definite sign of a tumor. The absence of such an interval strongly indicates that the tumor antedated the injury. The type of tumor often reveals whether it could have grown in the particular time period. The malignant process may be presumed to arise in a late period, months or years after the injury, from the disturbance caused by scarring and imperfect function and nutrition. The longer the interval, the less certainly the tumor may be referred to trauma. In cases with a long interval there should be so-called bridging symptoms. For example, if a wound of an apparently normal tissue never healed, if pain, swelling and discharge persisted for weeks until the definite appearance of a malignant process, then one must accept the assumption of a traumatic origin and rely upon other features if the traumatic theory is to be rejected. Ewing does not feel that bridging symptoms are of significance in tumors of internal organs.

The Positive Diagnosis of the Presence and Nature of the Tumor is Essential: Biopsy and autopsy should be made mandatory. Microscopic examination often reveals that the primary tumor is tuberculosis, syphilis, lymphogranuloma, or some form of metastatic carcinoma. It may show that the tumor is a slow-growing process that antedated the injury. The tumor must be of a type that may easily be referred to trauma and which is consistent with all the facts in the case. The traumatic theory is applied with difficulty to the entire group of tumors arising from tissue rests.

Ewing further stated: "The interpretation of compensation laws should recognize that trauma is never the sole cause of cancer, and often only a subordinate, although determining, cause; that the probability of coincidence is very great; that aggravation by injury is rare and difficult to establish, and that many difficulties and uncertainties will continue to surround this subject for a long time to come. Some form of partial liability seems necessary to meet these conditions. Without it the compensation law becomes a form of sickness insurance against the natural occurrence and ordinary consequences of one of the major causes of disability and 10% of the deaths."

Animal Experiments

MOST animal experiments on the subject of trauma and malignant tumors concern the effect of trauma upon an already existing malignant tumor rather than producing the tumor by injury. In this type of experiment Lubarsch[24] concluded that trauma could be accepted as a factor in growth if (a) violence were severe, localized and caused long continued injury at the same point at which the tumor later appeared, and (b) the histologic structure of such a tumor made it reasonable that the growth was due to injury.

In a series of 12,000 autopsies on the bodies of mice dying at all ages either from natural causes or in a relatively small proportion from accidents, Slye[25] found only 87 mice with neoplasms meeting all the criteria of sarcoma. In at least 11 of these, sarcoma arose at the site of a previous injury. She had no knowledge of how many of the other mice had received injury at the point at which they subsequently developed sarcoma. There are many injuries to mice, especially among the males, when the wounds are often received in fighting. She stated the influence of heredity in determining the development of sarcoma at the site of old wounds was especially noticed in this series and found to be important.

Experimental cancer is now being produced by many agents but always under quite specific conditions not related to trauma. Knox and Ewing have both stated that attempts to produce tumor by trauma experimentally have all failed.

Conclusion

A SINGLE injury to previously healthy tissue has never been definitely proved to cause cancer.

2. The occasional production of cancer in this manner cannot be absolutely disproved. To be considered as a possibility, the case must fulfill Ewing's posulates.

3. No one has succeeded in experimentally producing a series of malignant tumors by trauma.

4. Trauma reveals more malignant tumors than it causes.

Discussion:

A. R. METZ, M.D., F.A.C.S., Chicago: We are indebted to Dr. Davis for calling our attention to the true relation of trauma to malignancy.

During the past 20 years 150,000 injury cases have been reported to the Claim Department of the Milwaukee Railroad and there has never been a lawsuit in which a claim of malignancy was made.

In a study of another series of injuries, consisting of fractures and lacerations, in a group of over 50,000 there has never been a malignancy come to our attention.

If trauma is to be classed as an etiological factor in carcinomas or sarcomas, we surely would expect it to occur at least once in 100,000 injuries.

With this negative evidence it appears fair to conclude that some other cause than trauma would have to be determined for malignancies.

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Dust Diseases

—*and Workmen's Compensation Legislation*—

PNEUMONOCONIOSIS,[1] or dust disease,* one of the most extensive of the graver occupational diseases, endangers approximately 500,000 workers[2] in the United States and annually leaves in its wake a train of several thousand disabled victims in addition to several hundred deaths.[3] This menace has for some time been universally recognized by experts in public health and labor legislation,[4] has become increasingly a familiar problem to employers during the depression,[5] and has resulted in a resurgence of legislative interest within the last two years.[6] But the problem was not brought forcibly to popular attention until, in the present year, a concentrated outburst of deaths from silicosis aroused indignant comment and a Congressional investigation.[7] Despite this growing notoriety, insufficient effort has been expended to prevent the disease,[8] and clear provision is today made for its victims in the workmen's compensation acts of only 12 states.[9]

Liability at Common Law. In the two jurisdictions which do not possess a compensation act,[10] and ordinarily in the vast majority of states whose statutes do not clearly compensate for dust diseases,[11] the remedy of the worker afflicted with pneumonoconiosis lies only in the common law. Indeed, even where acts ordinarily afford some measure of relief to dust victims, the common law remedy must be sought under certain circumstances.[12] Relief may be barred at the outset in a very few states,[13] by the highly questionable

1. This is the generic term. The disease thought to be caused by a particular mineral is given a name derived from that of the mineral, as "silicosis," which is by far the most important, from silica. Sayers and Jones, *Silicosis and Similar Dust Diseases*, Proceedings at National Conference on Silicosis, April 14, 1936 (U. S. Dept. Labor 1936) 2. But the generic term is not commonly extended to dusts, such as organic dusts, which may produce respiratory irritation but do not cause pulmonary fibrosis.

2. See Sayers and Jones, *op. cit. supra* note 1, at 5, 6; *cf.* Andrews, *The Tragedy of Silicosis* (1936) 26 Am. Lab. Rev. 3. All such estimates admittedly do no more than indicate the order of the problem. Certain other afflictions, such as "industrial dermatitis," may have a higher incidence [see Hayhurst, *Occupational Diseases in Ohio* (1936) 32 Ohio St. Med. J. 676, 677, 679] but pneumonoconiosis remains a more serious menace because of its incurability and the progressiveness of well-developed cases even in the face of removal from exposure (Sayers and Jones, *op. cit. supra* note 1, at 21), as well as its susceptibility to complication by tuberculosis. *Id.* at 20. But *cf.* Hayhurst, *Silicosis* (1936) 12 Ohio Health News, No. 11, 4.

3. Harrington, *Silicosis as Affecting Mining Workmen and Operatives* (Info. Circ. No. 6867, U. S. Bureau Mines 1936) 5. (Apparently this estimate is only approximate.)

4. See Silicosis, Record of the International Conference Held at Johannesburg (Int. Lab. Off. Studies and Rep., Series F, No. 13, 1930).

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5. Although it had generally been known that workers in dust trades were susceptible to lung disease, it was not until the depression that common law actions in large numbers were brought to recover for pneumonoconiosis, and hence employers made acutely aware of it. Hirth, *Silicosis as an Employer Problem*, Proceedings, *Supra* note 1, at 10. *Cf.* McCann, *Silicosis in Rochester* (1934) 3 Industrial Medicine 386.

6. In a manner similar to that which presaged the great flood of workmen's compensation acts of 1911 to 1919, bills have been introduced in, and investigations started by 40 legislatures with a view to compensating for occupational diseases. Sappington, *The National Occupational Disease Situation* (1936) 5 Industrial Medicine 298; *cf.* (1936) 42 Monthly Lab. Rev. 1252.

7. The single event which crystalized opinion was the contraction of and subsequent death from silicosis of over 400 workers on the Gauley Bridge tunnel in West Virginia. See N. Y. World Telegram, Jan. 13, 1936, at 1; *cf.* N. Y. Times, Feb. 8, 1936, at 5; (1935) 4 I. J. Bull. No. 7, 4. A joint resolution for the investigation of conditions was thereupon proposed to Congress and hearings were held. See *Hearings before Subcommittee of the Committee on Labor on* H. J. Res. 449, 74th Cong., 2d Sess. (1936); *cf.* Andrews, *loc. cit. supra* note 2.

8. The tendency in the past to consider lung diseases as inevitable [see Frey, Proceedings, *supra* note 1, at 6] or to blame all dusts equally, long resulted in no special effort being given to the prevention of those actually most dangerous. Willson, *Dust in Industry* (1933), 55 Mech. Engineering 80.

9. These statutes are discussed *infra* p. 1149 *et seq.* Similarly, except in Great Britain, some British dominions, and a very few other countries, carefully planned compensation for dust diseases is still as infrequent abroad as in the United States. See 2 Occupation and Health (Int. Lab. Off. 1934) 408 *et seq.*; Report of the Special Industrial Disease Commission of Massachusetts (1934) 161 *et seq.*

10. *I.e.*, Arkansas and Mississippi.

11. The acts of these states, and the very remote opportunity for recovery under them, are discussed *infra* p. 1146 *et seq.*

12. Three types of circumstances occur under these acts which necessitate common law actions: where the act specifies coverage for only a limited number of dust diseases [*e.g.*, W. Va. Acts 1935, c. 79, § 5 (W. Va. Code Ann. § 23-6-5) (for "silicosis . . . due to . . . dust containing silicon dioxide (SiO_2)"; N. C. Pub. Laws 1935, c. 123, § 1, (b) 24, 25 [N. C. Code Ann. § 8081 (fff½)] (b) 24, 25) (for "asbestosis" and "silicosis")]; where the act is elective to the employer [*e.g.*, W. Va. Acts 1935, c. 79, § 2 (a) (W. Va. Code Ann. § 23-6-2a); Mass. Gen. Laws (1932) c. 152, §§ 21, 22, 26]; and where the act is compulsory for all but certain classes of employers, etc. [*e.g.*, N. Y. Workmen's Compensation Law (1936) § 3(1) Group 18 (exempts employers of less than four employees)].

13. Mabley & Carew Co. v. Lee, 129 Ohio St. 69, 193 N. E. 745 (1934); Webb v. Tubize-Chatillon Corp., 45 Ga. App. 744, 165 S. E. 775 (1932); Calhoun v. Washington Veneer Co., 170 Wash. 152, 15 P.(2d) 943 (1932) (*semble*, except as to actions based on violation of statutory duties); see Gordon v. Travelers Ins. Co., 287 S. W. 911, 912 (Tex. Civ. App. 1926). It must be admitted that the language of many compensation acts is enough to bear this interpretation [*e.g.*, W. Va. Code Ann. (Michie, 1932) § 23-2-6; *cf.* Wash. Rev. Stat. Ann. (Remington, 1932) § 7673]. But the doctrine has been widely and strongly rejected. Donnelly

holding[14] that, as to suits of employees against employers, the compensation act excludes all tort remedies not expressly granted therein.[15] In several other jurisdictions, recovery may be just as effectively precluded by decisions holding that the common law provides no relief for occupational disease,[16] even though they are supported by doubtful reasoning[17] and an ill-founded dictum.[18] However, in the remaining states, the general accountability of the master for the conditions of employment is carried over from injuries due to accident to those arising from occupational disease.[19]

Basically, the duty of a master to his servants at common law is to use due care[20] either to provide reasonably safe working conditions, or, as is much easier and less efficacious,[21] to give warning of ordinarily undiscoverable hazards.[22] And he is not accountable if the servant, knowing of the danger, "assumes the risk."[23] Although the present knowledge of employers about dust diseases seems sufficiently ample to raise the common law duty,[24] the corresponding familiarity attributable to workers in dust trades[25] may be seized upon to bar recovery[26] and make meaningless the assertion of a duty in the employer.

However, another basis of common law recovery is open to a member of a class of workmen for whose benefit a mandatory statute has been enacted; he may recover for injuries proximately caused by a violation of the statute without the necessity of proving negligence[27] or of controverting an assumption of risk.[28] And statutes of this type specifically seeking to prevent pneumonoconiosis, although lacking or incom-

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v. Minneapolis Mfg. Co., 161 Minn. 240, 201 N. W. 305 (1924); Barrencotto v. Cocker Saw Co., 266 N. Y. 139, 194 N. E. 61 (1934) (silicosis); Jones v. Rinehart & Dennis Co., 113 W. Va. 414, 168 S. E. 482 (1933) (silicosis). However, the employer's common law defenses also survive under the majority rule. Wager v. White Star Candy Co., 217 App. Div. 316, 217 N. Y. Supp. 173 (3d Dept. 1926). *Contra: e.g.,* COLO. ANN. STAT. (Mills, 1930) § 2184a (assumption of risk abolished).

14. To the effect that such holdings are unwise, see Jellico Coal Co. v. Adkins, 197 Ky. 684, 690, 247 S. W. 972, 975 (1923); Jones v. Rinehart & Dennis Co., 113 W. Va. 414, 425, 168 S. E. 482, 487 (1933).

15. An effort to challenge the constitutionality of this rule has failed [Mozingo v. Marion Steam Shovel Co., 56 Sup. Ct. 959 (1936)] despite certain indications in an early case on the constitutionality of a workmen's compensation act that a reasonable equivalence of remedy must be granted when the employee's common law action is destroyed. See New York Central R. R. v. White, 243 U. S. 188, 201 (1917).

Where the act does cover the injury, this rule will be universally followed so as to prevent a common law action even where no compensation is available. Repka v. Fedder Manufacturing Co., 239 App. Div. 271, 267 N. Y. Supp. 709 (4th Dept. 1933) (plaintiff had contracted compensable disease, but was not yet "disabled" so as to be eligible for compensation); *cf.* Note (1936) 14 N.C.L. REV. 199, 200.

16. McCreery v. Libby-Owens-Ford Glass Co., 363 Ill. 321, N. E. (2d) 290 (1936) (pneumonoconiosis); Vogel v. Johns-Manville Products Corp., 363 Ill. 473, 2 N. E. (2d) 716 (1936) (denying action based on violation of statute; *cf.* Gordon v. Travelers Ins. Co., 287 S. W. 911 (Tex. Civ. App. 1926); see Adams v. Acme White Lead & Color Works, 182 Mich. 157, 161, 148 N. W. 485, 486 (1914).

17. The cases are made to rest on the assumption that though there is a duty to provide a "safe" place to work at common law, there is no duty to provide a "sanitary" place. Hence, no recovery at common law for occupational diseases. See McCreery v. Libby-Owens-Ford Glass Co., 363 Ill. 321, 326, 2 N. E.(2d) 290, 292 (1936). Possibly, however, the Illinois court was governed by a desire to frustrate a flood of allegedly racketeering silicosis actions [*cf.* Davis, *The Pneumonokoniosis Problem in Industry* (1936) 5 INDUSTRIAL MEDICINE 111, 124], and acted in view of the fact that a comprehensive occupational disease law had already passed [Ill. Laws 3d Spec. Sess. 1936, H. B. No. 10] under which flexible administrative procedure might weed out false claims.

18. The dictum is contained in Adams v. Acme White Lead & Color Works, 182 Mich. 157, 161, 148 N. W. 485, 486 (1914) Where this is said to be the common law rule because no contrary case, allowing recovery, could be found. Yet, in Michigan itself, the truth of this assertion is made highly questionable by Fox v. Peninsular White Lead & Color Works, 84 Mich. 676, 48 N. W. 203 (1891). Other important common law cases prior to the Acme case and allowing recovery for injuries commonly called occupational diseases are: Pigeon v. W. O. Fuller and Co., 156 Cal. 691, 105 Pac. 976 (1909) (lead poisoning); Wagner v. H. W. Jayne Chemical Co., 147 Pa. 475, 23 Atl. 772 (1892) (poisoning by dinitrobenzol); Texas & N. O. R. Co. v. Gardner, 29 Tex. Civ. App. 90, 69 S. W. 217 (1902) (chemical poisoning). And there are two important cases contemporary to the Acme case: Thompson v. United Laboratories Co., 221 Mass. 276, 108 N. E. 1042 (1915) (arsenic poisoning); Wiseman v. Carter White Lead Co., 100 Neb. 584, 160 N. W. 985 (1916) (lead poisoning).

19. Davis v. New Jersey Zinc Co., 182 Atl. 850 (N. J. 1936) (manganese dust poisoning); cases cited *supra* note 18; see DODD, ADMINISTRATION OF WORKMEN'S COMPENSATION (1936) 758.

20. Differences exist as to what is due care. The RESTATEMENT, AGENCY [§ 495, comment c; *cf.* § 493, comment c] requires the master "to inform himself of current advances and of the progress in industries of the same nature as his own." See also Thompson v. United Laboratories Co., 221 Mass. 276, 280, 108 N. E. 1042, 1044 (1915); Allen Gravel Co. v. Curtis, 173 Miss. 416, 161 So. 670 (1935) (pneumonoconiosis); 3 LABATT, MASTER AND SERVANT (2d ed. 1913) § 940. On the other hand, the standard is often asserted to be the "usual practice" of employers in a like business. 1 BAILEY, PERSONAL INJURIES (2d ed. 1912), §§ 67, 162-4. It seems clear that where preventive knowledge advances so rapidly as it does today regarding pneumonoconiosis [compare HATCH, DUST CONTROL (1934) [quoted in Info. Circ. No. 6848 (U. S. Bureau Mines 1935) 119], with DRINKER AND HATCH, INDUSTRIAL DUST (1936) *passim*] it is of utmost consequence which standard is chosen. *Cf.* Pennsylvania Pulverizing Co. v. Butler, 61 F.(2nd) 311 (C. C. A. 3d, 1932).

21. See Bohlen, *The Common Law Right of Action for Occupational Disease in Pennsylvania* (1915) 63 U. OF PA. L. REV. 183, 188 n. 12.

22. RESTATEMENT, AGENCY (1933) §§ 492, 499. The other duties, so often named [see *e.g.,* 1 BAILEY, *op. cit. supra* note 20, at § 66] may be regarded as mere particularizations of this fundamental rule.

23. RESTATEMENT, AGENCY (1933) § 521. Ordinarily, an employer may assume that those applying for work are conversant with the dangers which are inherent in the enterprise, but if the dangers are such that they are not commonly known but that the employer, by reason of his superior position, should know, he must warn. *Id.,* § 499, comment c.

24. Hirth, *op. cit. supra* note 5, at 1, 3.

25. See Frey, *loc. cit. supra* note 8; Harrington, *loc. cit. supra* note 3. Possibly in particular cases the operation of assumption of risk doctrine might be avoided on the ground that the necessary realization of the danger, as opposed to mere awareness of its causative elements, was not present. See RESTATEMENT, AGENCY (1933) § 521, comment b; *cf.* Brennan, *Occupational Disease* (1934) 65 ILL. MED. J. 29, 32.

26. In addition to the defense of assumption of risk, the failure of the employee to himself exercise due care would also prevent his recovery. RESTATEMENT, AGENCY (1933) § 525. Workmen are prone to neglect appliances preventive of pneumonoconiosis [Harrington, *supra* note 3, at 5], especially masks. REPORT OF MASSACHUSETTS COMMISSION, *supra* note 9, at 150. Despite these theoretical defenses (see also Bohlen, *supra* note 21, at 186, 190) recoveries are occasionally allowed in courts of last resort. *Cf.* Allen Gravel Co. v. Curtis, 173 Miss. 416, 161 So. 670 (1935) (pneumonoconiosis). And some states expressly abolish these defenses in common law actions of employee against employer. *E.g.,* PA. STAT. ANN. (Purdon, 1931) tit. 77, § 41.

27. See Note (1935) 20 CORN. L. Q. 392, 396. However, violations of rules and regulations promulgated by administrative bodies would, in New York, constitute only "evidence of negligence" and not "negligence per se." Schumer v. Caplin, 241 N. Y. 346, 150 N. E. 139 (1925), adversely criticized in (1926) 26 COLUMBIA LAW REV. 759.

28. Suess v. Arrowhead Steel Products Co., 180 Minn. 21, 230 N. W. 125 (1930) (tuberculosis caused by dust); Fitzwater v. Warren, 206 N. Y. 355, 99 N. E. 1042 (1912); *cf.* Dodd v. Independence Stove & Foundry Co., 330 Mo. 662, 51 S. W. (2d) 114 (1932); Bohlen, *supra* note 21, at 190. *Contra:* St. Louis Cordage Co. v. Miller, 126 Fed. 495 (C. C. A. 8th, 1903).

plete in many states,[29] are growing in number and extent.[30] Nevertheless, there is little reason to suppose that the common law offers the dust disease victim any more satisfactory remedy than that afforded decades ago to the victim of industrial accident;[31] in fact, the obstacles to recovery are even greater.[32]

ACTS NOT CLEARLY COMPENSATING PNEUMONOCONIOSIS. In adopting the early compensation acts of this country, most legislatures sought to compensate injuries arising out of accidents.[33] But efforts on the part of employees to bring all diseases within the purview of these acts[34] have led the courts into a confusion of concepts which made entirely uncertain the coverage of the statute.[35]

Although differences in language as to what is compensable exist among the states which have not explicitly provided for dust diseases,[36] the particular refinements have to a large extent been ignored by the courts.[37] Unanimously, the courts of these jurisdictions permit compensation for disease caused by accident,[38] but deny it for "occupational disease,"[39] commonly defined as a malady naturally resulting from the employment.[40] "Occupational disease" hence becomes a statement of the conclusion of non-compensability.[41] Seizing upon this label, a few courts have gone on to state that where it is caused by the employer's negligence, the disease is not occupational and is, therefore, compensable.[42] An extensive coverage may, on this basis, be imported into the statute by holding pneumonoconiosis, which is largely preventable,[43] to have been caused by the negligence of the employer in failing to use preventive appliances.[44]

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29. A collection of these statutes, through 1936, appears in SURVEY OF THE STATUTES AND COURT DECISIONS RESPECTING OCCUPATIONAL DISEASE FROM AIR POLLUTION (Air Hygiene Foundation of America, 1936) *passim; cf.* REPORT OF MASSACHUSETTS COMMISSION, *Supra* note 9, at 52 *et seq.*

30. See, *e.g.* Ill. Laws 3d Spec. Sess. 1936, H. B. No. 11, 13; N. Y. WORKMEN'S COMPENSATION ACT (1936) art. 4-a, § 65(2). *Cf.* Jones, *The Problems of Occupational Disease in Industry* (1934) 48 SAFETY ENGINEERING 347; N. Y. Herald-Tribune, June 10, 1936, at 12, col. 1.

31. The objections then existent are well set forth by DODD, *op. cit. supra* note 19, at 19 *et seq.*

32. One of the grave difficulties not ordinarily present in actions based on sudden injury concerns the likelihood that recovery for pneumonoconiosis, which may not be apparent for some years after the cessation of exposure, would be barred by the statute of limitations. Usually it has been held that the "injury" for which recovery may be had at common law is the impact of particles of dust, which ceases at the end of the dust employment, and not the resulting disability. Schmidt v. Merchants Despatch Transportation Co., 270 N. Y. 287, 200 N. E. 824 (1936) (silicosis); Scott v. Rinehart & Dennis Co., 180 S. E. 276 (W. Va. 1935) (silicosis). But see Grant v. Fisher Flouring Mills Co., 181 Wash. 576, 44 P. (2d) 193 (1935).

33. See DODD, *op. cit. supra* note 19, at 18, 757. Often the intention was made very clear by defining "injury" to exclude "disease." *E.g.*, La. Acts 1914, No. 20, § 39. On the other hand, a minority compensated simply for "injury," without employing restrictive definitions, *e.g.*, Conn. Pub. Acts 1913, c. 138, Part B, § 1; Mass. Acts, 1911, c 751, Part II, § 1; Mich. Laws 1st Ex. Sess. 1912, No. 10, Part II, § 1; Ohio Laws 1911, S. B. 127, § 21. Although this language apparently differs significantly from that of the English "by accident" act which the legislatures had before them, the courts of all but one of these states established a "by accident" interpretation, notwithstanding. Miller v. American Steel & Wire Co., 90 Conn. 349, 97 Atl. 345 (1916); Adams v. Acme White Lead & Color Works, 182 Mich. 157, 148 N. W. 485 (1914); Industrial Comm. of Ohio v. Brown, 92 Ohio St. 309, 110 N. E. 744 (1915). Only in Massachusetts did the courts construe such a statute to include occupational diseases. *In re* Hurle, 217 Mass. 223, 104 N. E. 336 (1914); Johnson v. London Guarantee & Accident Co., 217 Mass. 388, 104 N. E. 735 (1914); Sullivan's Case, 265 Mass. 497, 164 N. E. 457 (1929) (pneumonoconiosis). In Illinois, from the beginning, some occupational diseases were explicitly covered by a special act. See REPORT OF THE COMMISSION ON OCCUPATIONAL DISEASES (Ill. 1911) and the legislation resulting therefrom, ILL. REV. STAT. (1935) c. 48, ¶¶ 182-200, partially vitiated in Parks v. Libby-Owens-Ford Glass Co., 360 Ill. 130, 195 N. E. 616 (1935) on the basis of its vagueness. For modern statutes, see *infra* p. 1149 *et seq.*

34. See, *e.g.*, the list of occupational diseases included under the Pennsylvania "accident" statute. REPORT BY THE PENNSYLVANIA COMMISSION ON COMPENSATION FOR OCCUPATIONAL DISEASE (1933) 42; *cf.* OCCUPATIONAL DISEASE LEGISLATION (Am. Pub. Health Ass'n 1931) 104 (same, for New York).

35. See *infra* notes 36-48.

36. For instance, the basic phrase of a few acts is "accidental injury" [MD. ANN. CODE (Flack, Supp. 1935) Art. 101, §§ 32, 65(6); OKLA. STAT. (Harlow, 1931) §§ 13350(7), 13351], while of most it is "injury by accident," which is said to differ significantly. Victory Sparkler Co. v. Francks, 147 Md. 368, 128 Atl. 635 (1925); Quality Milk Products Co. v. Linde, 159 Okla. 256, 15 P.(2d) 58 (1933); see Bohlen, *A Problem in the Drafting of Workmen's Compensation Acts* (1912) 25 HARV. L. REV. 328. In the states which define injury in terms of disease, the following groupings may be made: (1) acts defining injury in terms of itself [*e.g.* IOWA CODE (1935) § 1421(5) ("injury . . . shall not include a disease unless it shall result from the injury"); *cf.* MD. ANN. CODE (Flack, Supp. 1935) § 65(6) ("Injury . . . means only accidental injuries . . . and such disease . . . as may naturally result therefrom")]; (2) acts defining injury in terms of violence to the body and disease resulting therefrom [*e.g.*, PA. STAT. (Purdon, 1936) tit. 77, § 411]; (3) acts specifically excluding occupational disease [*e.g.*, Neb. Laws 1935, c. 57, § 42 (NEB. COMP. STAT. § 48-152(b))].

37. Although some states with "accidental injury" statutes purport to distinguish them from "injury by accident" statutes [see Victory Sparkler Co. v. Francks, 147 Md. 368, 381, 128 Atl. 635, 639 (1925)], it would seem that most courts cite cases on this matter from jurisdictions which have statutes of differing terminology. See *In re* Pero, 52 P.(2d) 690, 695 (Wyo. 1935); Ramsey v. Sullivan Mining Co., 51 Idaho 366, 377, 6 P.(2d) 856, 859 (1931).

38. Brown v. English, 159 Okla. 208, 15 P.(2d) 17 (1932) (sudden inhalation of quantity of cement dust); Chamberlain, *Workmen's Compensation for Diseases Due to Employment* (1924) 10 A. B. A. J. 647, 648. In many states the courts are merely following an express section in the act [*e.g.*, TEX. STAT. (1928) art. 8309] or one with a very strong implication [*e.g.*, IDAHO CODE ANN. (1932) § 43-1810]; *cf.* Breen v. Morgan Crucible Co., 26 B. W. C. C. 368 (C. A. 1933) (acceleration of pneumonoconiosis by sudden cloud of dust).

39. Steel v. Cammell, Laird & Co. [1905] 2 K. B. 232 (C. A.); Peru Plow & Wheel Co. v. Industrial Comm., 311 Ill. 216, 142 N. E. 546 (1924) (siderosis); Sinsko v. A. Weiskettel & Sons Co., 163 Md. 614, 163 Atl. 851 (1933). A British court has rejected persuasive analogy (Selvage v. Charles Burrell & Sons, Ltd. [1921] 1 K.B. 355) for holding dust disease compensable as the result of a series of minute accidents. Cole v. London & Northeastern Ry. Co., 21 B. W. C. C. 87 (C. A. 1928); *cf.* McNeely v. Carolina Asbestos Co., 206 N. C. 568, 174 S. E. 509 (1934).

40. Chamberlain, *loc. cit supra* note 38; Note (1925) 10 CORN. L. Q. 529, 530. Compare the medical definition, as disease caused by conditions actually existent in industry. Hayhurst, *Occupational Diseases in Ohio* (1936) 32 OHIO STATE MED. J. 676.

41. *Cf.* Dillingham's Case, 127 Me. 245, 142 Atl. 865 (1928); U. S. Gypsum Co. v. McMichael, 146 Okla. 74, 293 Pac. 773 (1930).

42. Victory Sparkler Co. v. Francks, 147 Md. 368, 379, 128 Atl. 635, 638 (1925); Seattle Can Co. v. Dept. of Labor and Industries, 147 Wash. 303, 265 Pac. 739 (1928). This theory may be comparable to the "unexpectedness" theory (see note 47, *infra*) if the negligence of the employer is considered to be always unforeseen by the employee.

43. Although only very fine dust is dangerous [Sayers and Jones, *op. cit. supra* note 1, at 7 *et seq.*] efficient means of keeping concentrations below threshold limits are available in most trades. Harrington and Davenport, Review of Literature on Effects of Breathing Dusts (Info. Circ. 6848, U. S. Bureau Mines 1935) at 124 *et seq.*; DRINKER AND HATCH, *loc. cit. supra* note 20.

44. *Cf.* Sinsko v. Weiskettel & Sons, 163 Md. 614, 163 Atl. 851 (1933). But such an expansion would make acutely noticeable the violation by the statute of the fundamental purpose of workmen's compensation acts to spread the inevitable risk of industry [Walton, *Workmen's Compensation and the Theory of Professional Risk* (1911) 11 COLUMBIA LAW REV. 36; *cf.* Witte, *The Theory of Workmen's Compensation* (1930) 20 AM. LAB. LEG. REV. 411] inasmuch as the victims of unpreventable diseases would not be protected under this theory. See also Morrison v. Tennessee Coal Co., 162 Tenn. 523, 526, 39 S. W.(2d) 272, 273 (1931).

Although the theory to the effect that a "sudden outburst" of disease is compensable has been employed to support a recovery in a pneumonoconiosis case,[45] the slow development of most dust disease cases makes this doctrine largely inapplicable.[46] Similarly, recovery may be had if the injury is "unexpectedly" received by the worker;[47] but this postulate, closely resembling the doctrine of assumption of risk,[48] will in the ordinary case preclude an award in dangerous dust trades where workers are aware of the hazard.

Thus varying, uncertain results obtain in states not directly meeting the problem of silicosis and its related diseases. Even praiseworthy attempts in these jurisdictions to safeguard dust victims through judicial distortion[49] can not be a proper substitute for clearly intended, carefully planned compensation.[50]

SPECIAL PROBLEMS UNDER ACTS CLEARLY COMPENSATING DUST DISEASES. The statutory provisions of the 12 jurisdictions in which compensation for dust disease is provided[51] differ widely, ranging in scope, from an elaborate article covering one strictly defined type of pneumonoconiosis,[52] to detailed acts intended to cover sudden injuries with but scant mention of disease.[53] An analysis will be attempted of the more important problems arising in the administration of these statutes, although all these matters may not be treated in the legislation of any one jurisdiction.

A. *Form of Coverage.* The forms by which basic coverage is achieved fall roughly into three groups: those granting a general coverage,[54] those covering "occupational disease,"[55] and those covering only diseases listed in a schedule.[56] In compensating pneumonoconiosis, a well recognized occupational disease, disputes center about whether the last, or one of the first two forms should be employed. Advocates of schedules[57] assert that they provide a better administrative guide,[58] hinder abuse,[59] reduce litigation,[60] and possibly aid the proof of the employee.[61] Their opponents emphasize the unfairness to a worker injured by one of the new occupational afflictions constantly arising,[62] and the undue complexity flowing from

45. Beaver v. Morrison-Knudson Co., 55 Idaho 275, 41 P.(2d) 605 (1934) (pneumonoconiosis with tuberculosis); *cf.* Matthiesen & Hegeler Zinc Co. v. Industrial Board, 284 Ill. 378, 120 N. E. 249 (1918) (arsenical poisoning).

46. Among physicians, a considerable dispute is current whether "acute" silicosis exists [See Sayers and Jones, *op. cit. supra* note 1, at 12; Hayhurst, *Silicosis* (1936) 8 ENGINEERING EXPERIMENT STATION NEWS (The Ohio State University) 10; Gardner, *Pathology of So-Called Acute Silicosis* (1933) 23 AM. J. PUB. HEALTH 1237], although all agree that necessary length of exposure varies inversely with intensity. Sayers and Jones, *supra,* at 9. But even those convinced of the existence of acute silicosis believe that two months is the extreme minimum exposure. Hayhurst, *supra,* at 12.

47. Ramsey v. Sullivan Milling Co., 51 Idaho 366, 6 P.(2d) 856 (1931); Quality Milk Products Co. v. Linde, 159 Okla. 256, 15 P.(2d) 58 (1933). A majority of courts require the injury to be sudden as well as unexpected. Thompson v. Amoskeag Mfg. Co., 86 N. H. 436, 170 Atl. 769 (1934); Matter of Lerner v. Rump Bros., 241 N. Y. 153, 149 N. E. 334 (1925); Bohlen, *supra* note 36, at 338 (English cases).

48. Moore v. Service Motor Truck Co., 80 Ind. App. 668, 142 N. E. 19 (1924); Reader v. Milwaukee Lumber Co., 47 Idaho 380, 275 Pac. 1114 (1929); Note (1933) 8 IND. L. J. 397, 399.

49. The confusion resulting is well illustrated by *In re* Pero, 52 P. (2d) 690 (Wyo. 1935).

50. These difficulties have been met in some states by legislation frankly compensating dust diseases. But not all difficulties as to coverage were cleared up. *Cf.* Kovaliski v. Collins Co., 102 Conn. 6, 128 Atl. 288 (1925). In other states, however, no change was even attempted. Compare Maine Laws 1915, c. 295, § 11, with MAINE GEN. LAWS (1930) c. 55, § 11.

51. See *infra.* The Federal Longshoremen's and Harbor Workers' Compensation Act [44 STAT. 1424 (1927), 33 U.S.C. §§ 901-950 (1934)] and the Federal Employees' Compensation Act [39 STAT. 742 (1916), 5 U.S.C. §§ 751-795 (1934)] might also be included although probably few cases of pneumonoconiosis fall under either. The Nebraska act [Neb. Laws 1935, c. 57, § 42 (NEB. COMP. STAT. § 48-152 (b)] is omitted even though its phrase "diseases . . . peculiar to the smelting or refining industries" might well include pneumonoconiosis [*cf.* Glodenis v. American Brass Co., 118 Conn. 29, 170 Atl. 146 (1934)], because no interpretative decisions or administrative constructions have been found. The states compensating by schedule some occupational diseases, but not pneumonoconiosis, (*i.e.,* Minnesota, New Jersey, Ohio, Rhode Island), are obviously not included, but their acts offer standards of criticism for those compensating pneumonoconiosis, and will be frequently cited.

52. W. Va. Acts 1935, c. 79 (W. VA. CODE ANN. §§ 23-6-1—23-6-18).

53. *E.g.,* WIS. STAT. (1933) §§ 102.01 (2), 102.03(d)(3); Wis. Laws 1935, c. 465 [Wis. Stat. § 102.18(1)], c. 488 [Wis. Stat. § 10. 565].

54. In this group belong: MASS. GEN. LAWS (1932) c. 152, § 26 ("personal injury"); WIS. STAT. (1933) § 102.01 ("mental or physical harm caused by accident or disease"); CAL. GEN. LAWS (Deering, 1931) Act 4749, § 6 ("injury or disease"); N. D. Laws 1935, c. 286, § 1 (N. D. COMP. LAWS ANN. § 396a3); D. C. [44 STAT. 1424 (1927), 33 U. S. C. § 902 (1934)] ("injury includes . . . occupational disease or infection").

55. CONN. GEN. STAT. (1930)§ 5226; MO. STAT. ANN. (Vernon, 1932) § 3305(b); N. Y. WORKMEN'S COMPENSATION LAW (1935) § 3(2).

56. The schedule may consist of one column: N. C. Pub. Laws (1935) c. 123, § 1(b) [N. C. CODE ANN. § 8081 (fff½) (b)]; W. Va. Acts 1935, c. 79, § 5 (W. VA. CODE ANN. § 23-6-5) (although silicosis is the only disease compensated); *cf.* N. J. Laws 1931, c. 33; R. I. Laws 1936, c. 2358, § 2 [R. I. GEN. LAWS § 1289 (2)]. Or it may consist of two columns, the first containing the names of the compensable disease, the second containing the supposedly causative processes or industries. KY. STAT. (Carroll, Supp. 1934) § 4880 (although the number of diseases is very limited); N. Y. WORKMEN'S COMPENSATION LAW (1935) § 3(2); *cf.* MINN. STAT. (Mason, 1927) § 4327(9); OHIO GEN. CODE (Page, Supp. 1935) § 1465-68a.

57. The arguments are usually predicated on a "two column" schedule although, except in the British Empire, there seems to be no clear preponderance of this form in this country or abroad. See OCCUPATIONAL DISEASE LEGISLATION, *op. cit. supra* note 34, at 4 *et seq.*

58. To the effect that schedules eliminate unnecessary testimony at administrative hearings as to whether a particular disease is "occupational" See REPORT BY PENNSYLVANIA COMMISSION, *op. cit. supra* note 34, at 5, 9, 61.

59. The claim is made that a general coverage statute would be strained by the abuse of "expert testimony" to result finally in extensive "health insurance." See Sherman, *Compensation for Industrial Diseases* (1917) 65 U. OF PA. L. REV. 513, 514; REPORT BY PENNSYLVANIA COMMISSION, *op. cit. supra* note 34, at 30, 31, 82. On the other hand, advocates of general coverage declare that abuse should and could be controlled by other methods. French, *Occupational Disease Compensation in California* (1929) 19 AM. LAB. LEG. REV. 388; *cf.* Wilcox, *The "Schedule" Fraud in Occupational Disease Compensation* (1934) 24 AM. LAB. LEG. REV. 119, 121 (showing that in states with general coverage, "health insurance" has not in fact resulted).

60. REPORT BY PENNSYLVANIA COMMISSION, *op. sit. supra* note 34, at 61, 81, 84. But *cf.* Wragg v. Samuel Fox & Co., Ltd. [1936] 1 K. B. 440 (illustrating the complexities which may arise under a schedule).

61. There may be set up, in schedule statutes, a rebuttable presumption that an employee who contracts the disease in the schedule corresponding to the process in which he is engaged, contracted it in that employment. *E.g.,* N. Y. WORKMEN'S COMPENSATION LAW (1922) § 47. Conversely, however, the workman may be barred if he has not contracted the scheduled disease in the requisite process. Sokol v. Stein Fur Dyeing Co., 216 App. Div. 573, 216 N. Y. Supp. 167 (1926); OHIO GEN. CODE (Page, Supp. 1935) § 1465-68a. See REPORT BY PENNSYLVANIA COMMISSION, *op. cit. supra* note 34, at 63, 89.

62. See Andrews, *Compensate All Occupational Diseases* (1927) 17 AM. LAB. LEG. REV. 261; REPORT OF MASSACHUSETTS COMMISSION, *op. cit supra* note 9, at 176. Novel forms of dust disease also appear. *Cf.* McPheeters, *A Survey of a Group of Employees Exposed to Asbestos Dust* (1936) 18 J. IND. HYG., 229.

the adoption of schedules.[63] Actual experience seems to demonstrate that the only advantage inhering in the use of schedules is facilitation of the workman's proof.[64] The New York act,[65] with its two column schedule in addition to its full coverage of all occupational disease, seems to present a sound compromise.[66]

B. *Election to Come under Act.* Of the jurisdictions which permit compensation for pneumonoconiosis, some have enacted a compulsory plan,[67] while others accord permission to the employer either to elect the entire compensation scheme,[68] or to elect separately the scheme relating to occupational disease[69] or some dust disease alone.[70] Since statutory sanctions to compel an election are typically omitted in the last group,[71] the effectiveness of this provision is questionable,[72] unless a fear of common law actions persists.[73].

C. *Time Provisions.* Several major problems regarding time have been faced by legislatures compensating pneumonoconiosis. In the first place, the question of whether those who contracted the disease at least partly prior to the effective date of the act are to be compensated has been greatly complicated by the fear of "accrued liability,"[74] and its potentialities of industrial dislocation and wholesale discharge of employees.[75] Special provisions have therefore been deemed necessary to ease the transition,[76] and thereby remove one of the greatest obstacles to the introduction of dust disease compensation. As to the period in which an employee must give notice of disability, some acts designate as the event from which time runs the first manifestation of symptoms,[77] while others signify disablement,[78] or the end of injurious exposure.[79] Of these, the last may be dismissed as having no relation to the time of disability; the second offers a much more certain guide in pneumonoconiosis cases than the first.[80] In the establishment of a period for barring claims, two requirements are frequently made: disablement must occur within a certain time after exposure, and the claim presented within a shorter time thereafter.[81] The slow development of dust diseases would seem to necessitate a basic period of at least three years.[82]

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63. See, *e.g.*, the immense complication of the schedules in the British silicosis schemes. [Collected in DAVIE, SILICOSIS AND ASBESTOSIS COMPENSATION SCHEMES (1932)]. *Cf.* LEGGE, INDUSTRIAL MEDICINE (1934) 34; Wragg. v. Samuel Fox & Co., Ltd. [1936] 1 K. B. 440.

64. French, *loc. cit. supra* note 59; Nelson, *Silicosis Problem Solved in Wisconsin* (1936) 26 AM. LAB. LEG. REV. 53; Wilcox, *loc. cit. supra* note 59. The grave difficulties with insurance rates which have arisen in many states [Jones, *Occupational Disease Compensation* (1936) 5 INDUSTRIAL MEDICINE 179] would hardly have been lessened by providing compensation through schedules, unless these schedules had been very narrow, with consequent individual injustices. But *cf.* Sayer, *The Silicosis Situation under the New York Law* (1936) BULLETIN OF THE ASSOCIATION OF CASUALTY AND SURETY EXECUTIVES, No. 45, 9.

65. N. Y. WORKMEN'S COMPENSATION LAW (1935) § 3(2).

66. See Dodd, *op. cit. supra* note 19, at 771. The general coverage clause would cover all novel occupational diseases. Plainly, however, this does not meet the "health insurance" objection (see *supra* note 59).

67. *E.g.*, CAL. GEN. LAWS (Deering, 1931) Act 4749, § 8; N. Y. WORKMEN'S COMPENSATION LAW (1922) § 3.

68. *E.g.*, MASS. GEN. LAWS (1932) c. 152, §§ 21, 22, 26 (election by taking out insurance). Since 1933, when rates became extremely high, many employees in the granite industry have been without any compensation. See Jones, *supra* note 64, at 180. *Cf.* WIS. STAT. (1933) § 101.06 (election presumed in absence of rejection).

69. *E.g.*, MO. STAT. ANN. (Vernon, 1932) § 3305(b).

70. KY. STAT. (Carroll, Supp. 1934) § 4880 (joint election by employer and employee); W. Va. Acts 1935, c. 79, § 3 (W. VA. CODE ANN. § 23-6-3) (election by subscribing to insurance fund).

71. The sanctions obtaining in West Virginia in the case of accident compensation, *i.e.*, the loss of common law defenses by the employer, are expressly made inapplicable to non-election to compensate silicosis. W. Va. Acts 1935, c. 79, § 2(a) [W. VA. CODE ANN. § 23-6-2(a)]. *Contra:* Ill. Laws 3d Spec. Sess. 1936, H. B. No. 10, § 3. The Missouri statute is not clear [MO. STAT. ANN. (Vernon, 1932) §§ 3302, 3305(b)] but by interpretation the non-electing employer does not lose his defenses. Letter from Spencer H. Givens, Secretary Missouri Workmen's Compensation Commission, May 15, 1936.

72. In West Virginia, out of 4,250 subscribers, with 220,000 employees, to the accident fund, seven, with 6,000 employees, subscribe to the silicosis fund. Letter from H. C. Davis, Comptroller, Office of West Virginia Compensation Commissioner, May 19, 1936. Since about nine per cent. of an average group of industrial employees are exposed (Sayers and Jones, *op. cit. supra* note 1, at 5), the elections seem very low.

73. It is believed that especially in 1934, the year of greatest "silicosis scare," employers in Missouri were greatly influenced toward election by fear of common law actions. Letter from Spencer H. Givens, *supra* note 71.

74. This liability has been one of the most important factors preventing full compensation for pneumonoconiosis. The slow development of pneumonoconiosis gives the workman a certain ability to "select" the date of disability; likewise it means that the cases caused by the faster machinery adopted in many dust trades since the war are only now beginning to incapacitate their victims. REPORT OF MASSACHUSETTS COMMISSION, *op. cit. supra* note 9, at 174. Impressed by these facts, insurance carriers set enormous rates in several states [see Jones, *loc. cit. supra* note 64], which appear unrelated to the number of claims filed. *E.g.*, in New York from Sept. 1, 1935 to Mar. 1, 1936, only eight claims for silicosis were filed [AM. LAB. LEG. REV. PRESS RELEASE (Apr. 3, 1936) 2], yet meanwhile insurance rates rocketed. See Sayer, *supra* note 64, at 11.

75. *Id.* at 12. Discharge of men who will probably become disabled, at the instance of insurance companies, has been widely practiced. A spectacular example of this was a major factor in the appointment of the Massachusetts Commission. See REPORT OF MASSACHUSETTS COMMISSION, *op. cit. supra* note 9, at 11. The Wisconsin legislature found special compensation necessary to care for discharged employees. Wis. Laws 1935, c. 488 (WIS. STAT. § 102.565); *cf.* Schafer v. Industrial Commission, 220 Wis. 384, 265 N. W. 390 (1936).

76. Ill. Laws 3d Spec. Sess. 1936, H. B. No. 10, § 23 (employee with prior pneumonoconiosis but no disability may waive half of compensation apparently in order to retain his job); *cf.* W. Va. Acts 1935, c. 79, § 15 (W. VA. CODE ANN. § 23-6-15); N. Y. WORKMEN'S COMPENSATION LAW (1936) Art. 4-a, § 66 (mandatory graduated compensation, rising $50 for each month after the effective date). *Contra:* N. C. Pub. Laws 1935, c. 123, § 1(e) [N. C. CODE ANN. § 8081(fff½)(e)] (no provision on this matter).

77. *E.g.*, *id.* at (o); *cf.* CONN. GEN. STAT. (1930) § 5234; *id.* (Cum. Supp. 1935) § 5245; *cf.* Bremner v. Marc Eidlitz & Son, Inc., 118 Conn. 666, 174 Atl. 172 (1934); Rossi v. Thomas F. Jackson Co., 120 Conn. 456, 181 Atl. 539 (1935).

78. N. Y. WORKMEN'S COMPENSATION LAW (1922) § 45.

79. W. Va. Acts 1935, c. 79, § 10 (W. VA. CODE ANN. §23-6-10).

80. See Associated Indemnity Corp. v. State Industrial Accident Commission, 124 Cal. App. 378, 381, 12 P.(2d) 1075, 1076 (1932). Yet the Connecticut statutes cited *supra* note 77 overruled cases expressly adopting time of disability. Michma v. Collins Co., 116 Conn. 193, 164 Atl. 502 (1933). See Farmer v. Bieber-Goodman Corp., 118 Conn. 299, 172 Atl. 95 (1934); *cf.* note (1936) 24 CALIF. L. REV. 594, 596 *et seq.*

81. See Ill. Laws 3d Spec. Sess. 1936, H. B. No. 10, §§ 5, 24 (disablement in all diseases but silicosis or asbestosis, for which time is three years, must occur within one year of last exposure; claim must be filed within six months of disablement).

82. N. C. Pub. Laws 1935, c. 123, § 1(g) [N. C. CODE ANN. § 8081(fff½)(g)]. For most other diseases the period may safely be shorter. It has been estimated that in ordinary, uncomplicated pneumonoconiosis, the progression of the disease will cease two years after exposure. Hayhurst, *supra* note 46, at 13. But. *cf.* PUBLIC HEALTH BULLETIN No. 187 (U. S. Pub. Health Serv. 1929) 132, 133.

Another problem with a time element, the allocation of liability among successive employers and insurance carriers, has aroused much discussion, and caused great difficulty in the courts. See REPORT BY PENNSYLVANIA COMMISSION, *op. cit. supra* note 34,

D. *Benefits.* Fear of a prohibitive cost in certain industries[83] has caused the New York legislature to provide lower benefits for death from pneumonoconiosis than from accident or other occupational disease,[84] but no other ground can be advanced to support the distinction. In the case of partial disability, the unlocalized quality of pneumonoconiotic incapacity probably justifies a different terminology of compensability, but not a total absence[85] of compensation or a rigid, reduced scale.[86] Nor can the fact that there is, as yet, no cure for pneumonoconiosis,[87] and that there is usually no pain,[88] justify drastic limits on medical benefits[89] which may be vitally needed if tuberculosis results.[90]

The slowness with which pneumonoconiosis develops has stimulated suggestions for a special type of compensation to aid men with detectable symptoms, but with no disability, to shift to less dangerous work.[91] Since many hazardous occupations are skilled, shifting would often involve a wage loss which leads labor to oppose removal from the particular employment and to insist rather upon prevention.[92] Yet if there are any useful trades in which pneumonoconiosis is preventable only at the expense of their economic destruction, such compensation seems advantageous.

E. *Wilful Self-Exposure and Misrepresentation of Employees.* Two severe bars to recovery face the victim of pneumonoconiotic disease under the statutes. Through his failure to employ certain distasteful preventive devices such as masks,[93] any subsequent disease contracted by him will not be compensated under the act because of his "wilful self-exposure."[94] In fact, a common law action has also been excluded.[95] Similarly, if an employee who has contracted a dust disease and been discharged therefor[96] seeks to secure another position by misrepresenting his condition, all compensation will generally be lost to him because of his misrepresentation.[97] In both cases, the pauperization implicit in these sanctions should be supplanted by some milder form of penalty.[98]

F. *Medical Examinations.* Physicians agree unanimously that individual susceptibility to pneumonoconiosis varies significantly,[99] with factors determinable on proper examination,[100] and that the best check on preventive practices is a periodical examination of employees.[101] Labor, however, opposes examination, fearing loss of jobs and certain abuses by employers.[102] The only two American acts which recognize the problem of examinations prior to and during employment reflect the conflict—one establishes compulsory examinations under state supervision[103], the other makes a strongly worded declaration of policy against them.[104] In administering the acts, special medical examiners are frequently provided[105] because of inability of the ordinary practitioner to diagnose pneumonoconiosis,[106] and in order to preclude any vestiges of fraud.[107]

CONCLUSION. Arguments advanced by opponents of full compensation for dust diseases have been grounded on economic expediencies, such as fear of competitive disadvantage with non-compensating states,[108] on predictions of abuse and

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at 69; Note (1933) 19 Marq. L. Rev. 251; *cf.* N. Y. WORKMEN'S COMPENSATION LAW (1922) § 44. The present uniform tendency, however, is to abandon notions of justice for the more convenient imposition of liability on the last employer and carrier. Ill. Laws 3d Spec. Sess. 1936, H. B. No. 10, § 25; N. Y. WORKMEN'S COMPENSATION LAW (1936) Art. 4-a, § 67. *Contra:* R. I. Laws 1936, c. 2358, § 10 [R. I. GEN. LAWS § 1289(10)]. See REPORT OF MASSACHUSETTS COMMISSION, *op. cit.* supra note 9, at 177.

83. Most of the fear is due to "accrued liability." See *supra* note 74.

84. Compare N. Y. WORKMEN'S COMPENSATION LAW (1936) Art. 4-a, § 66 ($3,000 maximum), with *id.* (1922) § 16 (maximum of 66⅔% of wages, figured at maximum of $150 per month, for life of certain beneficiaries).

85. *Id.* Art. 4-a. § 66.

86. As in W. Va. Acts 1935, c. 79, § 7 (W. VA. CODE ANN. § 23-6-7). Such a scale gives administrative simplicity, but runs counter to the progressive nature of pneumonoconiosis.

87. Sayers and Jones, *op. cit. supra* note 1, at 21.

88. See *Hearings Before Subcommittee of the Committee on Labor on H. J. Res. 449,* 74th Cong., 2d Sess. (1936) 169 (Dr. Sayers).

89. *E.g.,* compare N. Y. WORKMEN'S COMPENSATION ACT (1936) Art. 4-a, § 68 (90 days) with *id.* (1935) § 13(a) (unlimited).

90. See Nelson, *supra* note 64, at 54.

91. See, *e.g.,* N. C. Pub. Laws 1935, c. 123, § 1(j) [N. C. CODE ANN. § 8081 (fff½)(j)]; *cf.* W. Va. Acts 1935, c. 79, § 7(2) [W. VA. CODE ANN. § 23-6-7(2)]. See DODD, *op. cit. supra* note 19, at 716.

92. See Frey, *op. cit. supra* note 1, at 7.

93. See REPORT OF MASSACHUSETTES COMMISSION, *op. cit. supra* note 9, at 148, 150. In certain industries the mask is still the most effective preventive device.

94. KY. STAT. (Carroll, Supp. 1934) § 4882; W. Va. Laws 1935, c. 79, § 6 (W. VA. CODE ANN. § 23-6-6).

95. *Ibid.*

96. See *supra* note 75.

97. *E.g.,* N. Y. WORKMEN'S COMPENSATION LAW (1936) Art. 4-a, § 69; *cf.* W. Va. Acts 1935, c. 79, § 6 (W. VA. CODE ANN. § 23-6-6).

98. *E.g.,* as is done in N. C. CODE ANN. (Michie, 1931) § 8081 (t) (loss of moderate percentage of compensation).

99. Sayers and Jones, *op. cit. supra* note 1, at 16.

100. Hayhurst, *supra* note 46, at 11.

101. Bloomfield, *Engineering Control of Occupational Disease* (1936) 51 PUB. HEALTH REP. 655; Sayers and Jones, *op. cit. supra* note 1, at 27. Such examinations would also serve to weed out tuberculars, who are prone to transmit their disease to pneumonoconiotics. REPORT OF MASSACHUSETTS COMMISSION, *op. cit. supra* note 9, at 176.

102. See *The Silicosis Problem* (Editorial) N. Y. Times, April 22, 1936, p. 22, col. 3; *cf.* Searles, PROCEEDINGS, *supra* note 1, at 9.

103. N. C. Pub. Laws 1935, c. 123, § 1(i) [N. C. CODE ANN. § 8081 (fff½)(i)]. Compare the British Arrangement. Statutory Rules and Orders 1931, No. 341.

104. N. Y. WORKMEN'S COMP. LAW (1936) Art. 4-a, § 65(1).

105. A panel of examiners may be established. Mass. Acts 1935 c. 424 [MASS. GEN. LAWS c. 152, § 9B]. Or a board of examiners may be provided for. N. C. Pub. Laws 1935, c. 123, § 1 (q)-(u) [N. C. CODE ANN. § 8081 (fff½) (q)-(u)]. New York has both a panel and a board of "expert consultants." N. Y. WORKMEN'S COMPENSATION LAW (1936) Art. 4-a, §§ 70, 71.

106. See REPORT BY PENNSYLVANIA COMMISSION, *op. cit. supra* note 34, at 14; Letter from J. Dewey Dorsett, Chairman North Carolina Industrial Commission, Oct. 5, 1936. Taking a contrary stand: Hayhurst, *Diagnosis of Silicosis* (1936) 26 AM. LAB. LEG. REV. 61; Letter from Leo J. Noonan, Chairman Workmen's Compensation Commission of Connecticut, May 5, 1936 (ordinary medical provisions of compensation act suffice).

107. See REPORT BY PENNSYLVANIA COMMISSION, *op. cit. supra* note 34, at 35.

108. See Ferguson, *Pneumonokoniosis and Its Social Effects* (1936) 5 INDUSTRIAL MEDICINE 31; Sayer, *supra* note 64, at 12. Except as the possibly increased average price of an industry's products would reduce total demand, the whole economic problem reduces to this difficulty, with the further exception that financing of suddenly increased costs for the compensation or prevention might bankrupt some marginal firms. One suggested answer, a campaign for compensation throughout the country [Wilcox, *supra* note 59, at 121] is unsatisfactory in the short run, but probably indicates the ultimate result. Even without country-wide compensation, however, once "accrued liabilities" in compensating and preventing can be surmounted, competitive disadvantage should not prove fatal.

ultimate institution of "health insurance."[109] But neither attack demonstrates any incompatibility with accepted principles of workmen's compensation.[110] The more immediate economic disadvantage of prohibitive insurance rates arises largely from the temporary problem of "accrued liability,"[111] aggravated by the depression,[112] and, moreover, need not necessarily be so great as actually has been the case.[113] Basically, the solution lies in prevention, which is apparently technically and economically practicable in the vast majority of industries.[114] Full compensation would aid directly[115] and indirectly[116] in satisfying this desideratum, and would also, when substantially assimilated to accident compensation,[117] provide for cases which can not be or have not been prevented.

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109. See *supra* note 59; *cf.* note 108, *supra.*

110. See Beers, *Compensation for Occupational Diseases* (1928) 37 YALE L. J. 579; *cf.* Sherman, *supra* note 59, at 513; Witte, *supra* note 44, at 411.

111. See *supra note* 74. In at least one jurisdiction, this problem seems to have subsided already. Nelson, *supra* note 66, at 54; *cf.* McCord and Eyster, *The Monetary Cost of Occupational Disease Liability Insurance* (1936) 5 INDUSTRIAL MEDICINE 139, 143.

112. See *supra* note 5.

113. Connecticut has compensated pneumonoconiosis since 1919 [Conn. Pub. Acts 1919, c. 143, §§ 1, 18], with a small steady grist of cases, and without any problem during the depression; in fact the cases are growing fewer. Letter from Leo N. Noonan, *supra* note 106. In those states which have recently provided compensation *i.e.* where "accrued liability" would appear more likely to offer difficulty, there has been no rush of claims. *E.g.,* in North Carolina only four claims have been filed since the effective date, March 1, 1935. Letter from J. Dewey Dorsett, *supra* note 106.

114. See Osborne, PROCEEDINGS AT CONFERENCE ON SILICOSIS, Feb. 25, 1936 (U. S. Dept. Labor 1936) 11. But *cf.* Raycroft, PROCEEDINGS, *op. cit. supra* note 1, at 11 (emphasizing the expense).

115. The employer can more cheaply prevent than pay high insurance rates. 1 OCCUPATION AND HEALTH (Int. Lab. Off. 1930) 627; Sappington, *Integrated Control of Occupational Diseases* (1936) 26 AM. J. PUB. HEALTH 781, 785. But *cf.* Dodd, *op. cit supra* note 19, at 698.

116. *I.e.,* through the activity of insurance carriers. *Id.* at 560.

117. In such matters as the period of limitation, and perhaps in medical administration, variations from the ordinary accident compensation scheme seem necessary. See *supra* note 76, 80, 82, 105-7; *cf.* Beers, *supra* note 110, at 592.

Historical Supplement

DR. LEGGE'S History of Industrial Medicine and Occupational Diseases, in INDUSTRIAL MEDICINE for January, 1937, in Chapter XIII, under the heading "Investigators Throughout the World", on page 36, appeared with an incomplete list. In order that the summary may be complete, as Dr. Legge intended, the full enumeration under that subtitle is as follows:

AUSTRALIA: Pneumonoconiosis and lead poisoning: D. G. Robertson, of Melbourne; Badham, of New South Wales; H. W. Armit, of Sydney; Smith and W. Summons, of the Bendiago Mines.

AUSTRIA: Occupational hygiene: Rambousek; E. Brezini; H. von Schroetter; Sternberg; H. S. Jellinek; L. Bohler, of Vienna.

BRAZIL: In the field of forensic medicine and industrial diseases and accidents: A. Puxato; F. Favero; L. Ribeiro, of Rio Janeiro and Sao Paola.

BELGIUM: Industrial and compensation: Prof. Malvoz, at Liege; De Hermans, of Mons; Deladriera, of Brussels; De Net, at Chourg lez Mons; Mund, of Louvain; and L. Dejardins, of Brussels; M. Stassen, of Liege; M. De Laet; D. Gilbert, of Brussels.

CZECHOSLOVAKIA: Industrial physiology and social medicine: J. Lowy, of Prague.

DENMARK: S. K. Gudjonsson, of Copenhagen.

ENGLAND: Mine and factory hygiene and fatigue: J. S. Haldane; L. Hill; T. Oliver; T. M. Legge; E. L. Collis; Sir Arthur Whitelegge, of London, First Factory Inspector; G. P. Crowden, of London, and E. Atzler of Dortmund; P. White, of Manchester; F. Shufflebotham; C. S. Myers; Dr. J. C. Bridge; S. E. L. Middleton, of London.

FRANCE: Industrial hygiene and pathology: Thornat; Brouardel; Bremond; Heim de Balzac; Frois; Breton; Bargeron; Le Roy des Barres; E. Martin, of Saint-Etienne A. Policard, of Lyons; O. Crozon, of Paris.

GERMANY: Industrial toxicology: K. B. Lehmann; T. Weyl; F. Koelsch; L. Teleky, of Dusseldorf; Rost; Engel; Schlossmann; Gottstein; Ebury, of Wurzburg; L. Schwarz, and H. S. Schneider; Prof. Hahn, of Berlin; F. Flury.

GREECE: Industrial medicine and decompression: Catsaras and Savas.

Holland: Factory hygiene: Kranenburg and Boerma, The Hague; Dr. Heyermans, Amsterdam.

HUNGARY: Lead poisoning: Prof. Friedrich, and Chyzer; S. Maszak, of Budapest.

ITALY: Occupational hygiene: L. Devoto, of Milan; Gigioli; Ferranini; A. Montie, of Pavia; C. Biondi, of Sienna; S. G. Aiello, at Milan, Turin, and Naples; G. Pieraccini, of Florence.

JAPAN: Industrial physiology and psychology; Teruoka, at Kurasika; Dr. Kose, Tokyo.

NORWAY: Prof. Lorange, of Oslo.

POLAND: Industrial medicine: Karaffa-Korbut, and Zielinski; J. Rambousek, of Prague.

RUSSIA: Industrial hygiene and pathology: Kagan; Vigdortschik; Kaploune, and Lachtenkoff, of Leningrad, Kharkov and Moscow.

SOUTH AFRICA: Prevention of silicosis: A. Marrogordato; W. Watkins Pitchford; Ireland Orenstein, and Irvine.

SWITZERLAND: Forensic and industrial medicine: O. Roth; H. Zagger; Schuler, and Vogt, at Zurich, Basle, Geneva and Louvain; L. Carozzi, of Geneva.

UNITED STATES: Industrial hygiene, safety and mine hygiene: W. C. Hansen, R. R. Sayers; D. L. Edsall; Carey P. McCord; Geo. B. Kober; H. F. Smyth; Wade Wright; W. D. McNally; C. E. A. Winslow; R. T. Legge; C. O. Sappington; H. K. Pancoast; Alice Hamilton; Emery R. Hayhurst; A. J. Lanza; J. W. Schereschewsky; L. U. Gardner; E. P. Pendergrass; J. S. Cunningham; Fred L. Hoffman; Cecil K. Drinker; Philip Drinker; L. I. Dublin; F. S. Lee; Eugene L. Fisk; A. B. Emmons; L. Greenburg; Albert S. Gray; Yandel Henderson; H. H. Kessler.

Occupational Diseases

THE 1937 Annual Meeting of the American Association of Industrial Physicians and Surgeons has been announced for May 6 and 7, at Detroit, Michigan. This Meeting, the Twenty-Second Annual Convention of the A.A.I.P.&S., will be held at the Hotel Statler, in conjunction with the Midwest Conference on Occupational Diseases and the Annual Meeting of the Michigan Association of Industrial Physicians and Surgeons, the conference dates being May 3 to 7, inclusive.

The History of Industrial Medicine and Occupational Diseases

—An Historical Outline of Occupational Diseases, Industrial Hygiene and Surgery, Traced from Early Antiquity to the Great Depression of the Twentieth Century—

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Child Labor

IN THE chapter on occupations of antiquity, many instances are cited of early establishments owned and operated by men prominent in literature and history. It is said that the Romans during their occupation of Britain, had established industries for the making of clothing and armor for their troops.

In England during the reign of Henry VII (1269-1321) a great clothing manufacturing plant arose. At Kendel, woolen cloth was manufactured, while Edward III (1312-1377) sat upon the throne. Water wheels and windmills were used as power in mills and factories to grind cereals. The work shops in the medieval towns were extremely primitive in character.

In England, France, Holland, Germany, and Italy in the sixteenth and seventeenth centuries progress was being made in various fields of industry, the making of cloth, sugar, soap, porcelain, silk, and linen. At Derbyshire, England, in 1719, Sir Thomas Lime built the first factory for the manufacture of silk. The making of iron by the use of pit coal in 1756 also developed England's industrial resources. The greatest progress began with James Watt's invention of the steam engine in 1765, which was followed by Kay and Hargreave's spinning jenny in 1767. Arkwright's spinning machine of 1771 and the Cartwright power loom of 1785 laid the foundation for the textile industry on a larger scale and gave birth to the modern industrialism which spread to the great countries of the world.

With the development of the modern factory system of increased production, greater mortality and morbidity were brought about, due to urban congestion and unsanitary conditions. Child labor was introduced, and occupational diseases and accidents developed and increased. The regulation of these conditions eventually was instrumental in promoting modern public health and factory legislation. References to the subjects are to be found in earlier chapters in this book, under specific headings or in the chronological order of the period.

During the American colonial period, the first glass bottle factory was founded in Jamestown, Virginia, in 1607. The first cotton mill was built and operated in 1770 in the State of Rhode Island by Samuel Slater, of England. South Carolina can boast that it had a spinning factory operated by water power in 1790. Philadelphia built the first type foundry in 1794. The first glass house was constructed at Pittsburgh in 1796. Massachusetts in 1803 built the first steam-driven cotton mill in the United States, and at Waltham, Massachusetts, in 1813 was established the first factory to make cotton cloth from the raw material to the finished product.

Progress continued in all fields of manufacturing, ultimately making America foremost in this line.

Massachusetts followed England's example in 1852 and introduced the first factory laws in the United States, which in turn became the model for all the other states. These laws concerned inspection, sanitation, safety, fire protection, hours of labor, minimum wages, women in industry, child labor, and other important measures for the social, economic, and health safety of the workers.

The sweatshop system was introduced in our American cities by certain unscrupulous employers who took advantage of poverty stricken immigrants from Europe. They induced these workers to labor long hours under miserable conditions for very poor wages. Sweatshops are found mostly in the manufacture of wearing apparel. Frequently the home was the workshop, and the whole family worked, in an unsanitary state, with disease a menace and child labor abounding. It was this system of competition and abuse of the workers' health which was eventually legislated against in such states as Massachusetts and New York.

In 1902, C. F. L. Doehring, a student of Geo. M. Kober's at Washington, made the first official survey of industrial hygiene in America. This was done under the Hon. Carroll D. Wright, Commissioner of the Department of Labor, and the survey was made in the government shops in Washington.

In 1905, Massachusetts was investigating its factories under Dr. Wm. C. Hanson.

Child Labor

WOMEN and children from the earliest civilization of man have been engaged in spinning and weaving cloth, as it was essentially a domestic and farm life industry. One can picture the long hours of labor it entailed, and can understand how, when power looms were invented, driven either by water or steam power, women and children naturally fell heir to this task, involving long hours of drudgery in overcrowded, unsanitary textile factories. These factories were the pioneer industrial plants in England and America, and were instrumental in producing urbanite congestion, child labor, and high morbidity and mortality among the workers. Eventually these conditions influenced the promotion of modern public health and child labor legislation. The protection of the growing child, its health, education and the build-

ing of its character, are the country's assets of tomorrow.

Sir Edwin Chadwick may be quoted as saying that working young children during the same stages as adults "is always injurious, as is likewise overwork for young and growing children whether the work be mental or moral." C. T. Thackrah, of Leeds, in the second decade of the century, expounded the cause against child labor, holding that "the employment of young children in any labor is wrong."

The inventions and reforms instituted by Lord Ashley, 1833, regarding child labor were instrumental in leading to a succession of acts raising the age limit in employing children to 12 years, and culminated with an act prohibiting children from working in white lead. The Children's Employment Commission of England in 1840 was the first to investigate the working conditions of child labor within and without the textile trades.

In the United States, the first Child Labor Law was enacted in Massachusetts in 1836, in Connecticut in 1842, in Maine in 1847, and in Pennsylvania in 1848. Certain Acts of Congress which provided laws regarding the working of children are as follows:

1890—In employing an apprentice for sea service, the employer must have the consent of the parents, and the boy must be healthy and over 12 years of age.

1891—Employment of children under the age of 12 years in underground mines is prohibited.

1906—National Committee on Child Labor was founded.

1912—Creation of the Children's Bureau.

The first Federal Child Labor Law was enacted September 1, 1916, but was declared unconstitutional by the United States Supreme Court in 1918. The Second Federal Law was passed in 1919, and this also was declared unconstitutional. It was so declared by Judge James E. Boyd, sitting at Greensboro, North Carolina, on the ground that Congress had exceeded its power under the interstate commerce clause of the constitution, and that under the fifth amendment a parent has the right to the services of his child, and the child has a right to work for his support.

The Child Labor Amendment, passed by the 68th Congress in 1924, gave Congress the right and power to limit, regulate and prohibit the labor of persons under 18 years of age. The powers of the several states is unimproved by this article, except that the operation of state laws shall be suspended to the extent necessary to give effect to legislation enacted by Congress.

President Franklin D. Roosevelt, by proclamation in 1933, abolished child labor in the United States.

In Shanghai, an Industrial Commission was formed in 1924 to abolish child labor, to conduct an anti-phosphorus campaign, and to introduce hygiene into industry.

Women in Industry

WOMEN have been accustomed to hard labor, as is evidenced among primitive early races; and in her daily work the woman has originated industry after industry. She has been the mother of children, she has tilled the soil, she has spun fabrics and made pottery, and has been the general laborer about the home. The militant side of primitive culture belonged to men, the industrial to women.

The Bible may be quoted as to this: (Exodus xi, 5) "The maid servant that is behind the mill"; (Matthew xxiv, 41) "Two women shall be grinding at the mill", and various other passages.

In medieval England, the records of Leicester, 1264, state that the remuneration of women weavers and wool wrappers was fixed by the guild. The Ordinance of Laborers, 1549, proclaimed that all able-bodied men and women, free and bond, without definite means of support, were to accept services at old rates of payment. The wages of women laborers in 1386 were fixed by statute, and in 1400 the weavers' guild provided an ordinance that no women should weave unless they were well taught and approved.

J. P. Frank in 1779 called for measures for the protection of women before and after childbirth, and expressed the desire to see women liberated for the three months preceding childbirth.

There was founded at Manchester a Literary and Philosophical Society, which later counted among its members Percival Pott, C. J. Thackrah, W. H. Gaskell and men like Robert Owen who devoted their energies to the protection of women and children employed in factories and workshops.

In 1840, according to Harriet Martineau of the United States, there were found to be practically only seven employments open for women as alternatives to marrying for a living: namely, teaching, needle work, keeping boarders, cotton mill work, typesetting, household service and book binding.

On account of the physical differences of women, certain health protective measures have been agreed upon, based on physiological grounds. Due to her physique, the elimination of strain and fatigue is necessary. Women are also more susceptible to certain toxic agents and have a greater tendency to tuberculosis in the earlier years of industrial employment. The function of motherhood, protection from immorality, and the regulation of employments are of concern to the industrial physician.

Through the efforts of the International Association of Labor Legislation at a conference in 1906 at Berne, Switzerland, 14 countries have entirely prohibited by international treaty the work of women between certain periods at night. Many of the states in America have adopted such laws.

In 1910, Italy established a compulsory system that all women wage earners in factories receive maternity benefits. In France teachers and females on the staff of the Departments of Post Telegraph and Telephones are granted, at the time of childbirth, a leave of absence for two months, together with full treatment.

The number of women industrially employed in the United States in 1920 was 6,549,399. Women are prohibited by law in most of the states to work in certain employments, such as mines and saloons. In Europe, Great Britain, Denmark, Holland, Portugal, and Rumania women under 18 years of age are prohibited to labor in dangerous lead trades. In certain states, the lifting of heavy weights by women is being regulated by legislative enactments. Women are forbidden to do house painting in England where lead is used.

In Germany, Norway, Hungary, Russia, and Great Britain, the female wage worker is granted

maternity benefits from four to six weeks, during which period she is forbidden to resume work.

Most employers of labor in American factories prohibit women working in hazardous trades, where lead, benzol and carbon bisulphide are used, because of the toxic effects on the generative organs. Over 34 states have legislation in female labor concerning hours of work, seats for women in certain occupations, and general hygienic surroundings.

Industrial Associations

IN 1886 the International Association of Factory Inspection was organized at Philadelphia; and in Chicago, in 1888, the American Association of Railroad Surgeons was founded.

In 1906 the American Association for Labor Legislation was organized in New York. Its purpose was to improve industrial conditions that needlessly involve loss of life, health, and productivity of the workers; and to promote uniform labor legislation in the interests of the whole community. Much of the association's success has been due to the zeal of its secretary, Dr. John B. Andrews. The following outstanding accomplishments have made the association a real aid to the worker:

Federal and state workmen's accident compensation laws have been passed through its efforts. "Phossy jaw" has been abolished through Congress; extra protection has been given to compressed air workers; much work has been done for the prevention of lead poisoning. Weekly rest days have been obtained for thousands of workers. Cooperation has been given in securing vocational retraining for industrial cripples. Industrial commissions have been created for unified administration. Rock dust laws have been passed to protect thousands of coal miners. Cooperation has been given in securing old age pension laws. A practical program has been carried on for the prevention of unemployment.

The membership includes prominent public officials, economists, social workers, physicians, ministers, lawyers, wage-earners, manufacturers, industrial engineers, personnel managers, and other farsighted and public-spirited men and women.

The National Safety Council was organized in Chicago in 1911. It is an organization for the promotion of safety to human life in the industry of the United States. This council added a department for the study of occupational diseases and their prevention, under Dr. C. O. Sappington.

The Committee on Factories of the Chicago Tuberculosis Institute, composed of Dr. James Britten, Dr. Theodore Sachs, and Dr. Henry Faville, was instrumental in extending its tuberculosis work to many industries in Chicago. In 1914 it presented its views on industrial tuberculosis before the National Tuberculosis Association.

The Section on Industrial Hygiene was instituted in 1914 by the American Public Health Association, and in 1915 the American Medical Association instituted a Section on Industrial Medicine.

The American Association of Industrial Physicians and Surgeons was organized at Detroit, Michigan, in 1916. It aims to stimulate scientific investigations of the problems of industrial medicine, and to raise the standards of physicians engaged in industrial practice. Dr. J. W. Schereschewsky, of Washington, D. C., was the first President, with Dr. R. T. Legge, of California, as the first Vice-President.

United States Government Agencies

THE following named bureaus of the United States government were established in the interests of the laboring men, women, and children of this country. All of these departments devote their efforts to promoting industrial hygiene.

The United States Bureau of Labor was organized in 1865, with Dr. Carroll D. Wright as the first Commissioner of Labor. The duties of the Bureau consist of collecting information upon the subject of labor and its relation to capital, hours of labor, wages, and similar problems.

In 1902 the United States Public Health Service, which was formerly known as the Public Health and Marine Hospital Service, adopted its present name. A division of Industrial Hygiene and Sanitation was organized in 1915, under Dr. J. W. Shereschewsky. A special laboratory is assigned for the study of occupational diseases and hygiene, known as the Office of Hygiene and Sanitation. It was formerly located in Pittsburgh, but is now at Washington, D. C.

In 1903 an executive Department of Commerce and Labor was established, with an officer in the President's cabinet.

The United States Bureau of Mines was created in 1910. Its main duties are to improve the health conditions of miners, to increase safety, and to investigate explosives, dangerous gases and dust hazards.

The United States Children's Bureau, established in 1911-1912, is now in the Department of Labor. It is especially interested in dangerous occupations, accidents, and diseases that affect children in work.

During the World War the Council for National Defense outlined a most comprehensive program for industrial hygiene and medicine under the leadership of Dr. Otto P. Geier, of Cincinnati.

Museums

IN MANY of the capital cities throughout the world, government museums for the promotion of safety and sanitation have been established. They have as their objects to maintain exhibits and give demonstrations, to develop libraries and research laboratories, and to disseminate, by educational means, knowledge which will prevent physical suffering and premature death.

The first museum of safety was developed at Amsterdam in 1893. Berlin Museum was founded in 1903 as a permanent exhibit for industrial welfare. Dr. Charles Harrington, of the Massachusetts State Board of Health, held the First Industrial Hygiene Exhibit in America, in Boston in 1907. Vienna followed in 1909, and in 1911 New York established The American Museum of Safety.

The National Museum of Safety was started at Washington, D. C., in 1915, and instituted exhibits on safety devices. London opened a Museum of Safety, organized by the Home Office, in 1927.

Awards

THE American Museum of Safety has authority to award different medals to persons promoting efficient safety devices, employees performing notable work in protecting the lives and limbs of workers, for the promotion of occupational hygiene, prevention of electrical shock, and railroad safety for employees and passengers. These are supported by memorial funds, insurance companies, and philanthropists. Notable are the *Scientific American*, Travellers' Insurance Company, Louis Livington Seaman, Rathenau, E. H. Harriman, and Anthony N. Brady medals.

National and International Conferences

THE first National Conference held on Industrial Diseases in the United States was at Chicago in 1910, and was called by the American Association for Labor Legislation. At the Safety Congress in 1911 the National Council of Safety was instituted at the suggestion of Lew R. Palmer. The Fifteenth Congress on Hygiene and Demography, held at Washington, D. C., in 1912, had a section on occupational hygiene in which 64 contributions by distinguished experts were read. The American Federation of Labor in 1917 held a congress in Washington, called by Samuel P. Gompers to discuss recommendations for promoting health and efficiency among industrial workers.

At the Congress of the International Association of Labor Legislation (founded in 1867) held in Berlin, in 1890, the protection of workers in unhealthy trades was demanded. At its various congresses—held in Paris, 1896; Zurich, 1897; Paris, 1900; Milan, 1906; Brussels, 1910; Vienna, 1914; and Lyons, 1929—many questions on industrial hygiene and pathology were presented. The headquarters, formerly at Basle, are now situated in the International Labor Office at Geneva.

The VIIth International Congress on Industrial Accidents and Occupational Diseases convened at Brussels in July, 1935.

One of the outstanding scientific research institutions in America for the study of industrial diseases and toxicology of chemicals is the Industrial Health Conservancy Laboratories at Cincinnati, Ohio. The director, Carey P. McCord, M.D., has contributed much to the literature in this field, and has written an excellent book on industrial medicine.*

The Nela Reasearch Laboratory of the General Electric Company was founded in New York in 1907.

Federal Labor Legislation

WHEN the government of the United States directed interstate commerce and increased the number of civilian employees, Federal legislation relating to industrial hygiene became more necessary. Many acts of Congress provided enactments for the regulation of labor, safety of employees, inspection of hazardous employments, occupational diseases, child labor and the creation of bureaus which have interests in human welfare. Some of the foremost acts passed are as follows:

1892—Eight hours to constitute a day's work for employees in the United States service.

1893—Safety appliances on railroads.

1912—Use of poisonous white phosphorus matches was abolished in this country by the establishment of a prohibitive tax of two cents per 100 matches.

1916—Federal Workingmen's Compensation Law for civilian employees.

State Labor Legislation

THROUGHOUT the Union various laws have been passed for the protection of civilian workers, as for instance: oiling machinery while in motion, boiler inspection, ventilation in factories, safety appliances, fire escapes, lighting, explosives, etc.

1877—Massachusetts passes dust legislation.

1888—Massachusetts provides factory inspection.

1907—Oregon provides for dusty trades.

1909—New York was the first state to combat the hazard of compressed air.

1911—California was the first state to enforce compulsory reporting of occupational diseases.

Foreign Labor Legislation

THE application of steam power in the latter half of the eighteenth century gave rise to the modern factory system, and the inevitable baneful influences which were a necessary consequence of changed modes of life and labor became apparent. Some of the abuses that resulted on the part of employers were instrumental in early legislative investigations and the enacting of laws for the prevention of abuse and the protection of health and safety of workers. As a result, factory inspection was introduced.

ENGLAND:

1802—The Health and Morals Apprentice Act.

1833—Act to regulate the labor of children and young persons in mills and factories. Various amendments followed.

1901—Factory and Workshop Act for the protection of the health of the worker.

GERMANY:

1839—Act regulating the employment of young workers in factories.

1845—General industrial code.

1878—Law making factory inspection obligatory.

FRANCE:

1789—The Revolution abolished all privileges; among others the monopoly of guilds.

1806—Legislation of hours of beginning and stopping of work.

1827—Societe Industrielle de Mulhouse for the limitation of the abuses of the factory system and for the protection of women and children.

AUSTRIA:

1786—Regulation regarding factory apprentices.

1887—No child under nine years of age to be employed in factories.

1816—Protection of child workers.

1842—Hours of labor of children limited according to age of child.

BELGIUM:

1813—Imperial decree relating to workers in mines and prohibiting working of children under 10 years of age.

1884—Minimum age of child labor raised for boys to 12 years and girls to 14 years.

SWITZERLAND:

1877—First Federal labor legislation begins for protection of workers.

1881—Employers liability laws.

* Industrial Hygiene for Engineers and Managers, Harper & Bros., 1931.

Libel and the Right of Privacy

As They Apply to the Practice of Medicine

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APPARENTLY it makes very little difference whether a physician is a general practitioner or a specialist, whether he is a surgeon, obstetrician, roentgenologist or neurologist, whether he is engaged in private practice, is a member of a clinical group, or is a full time or part time employee of a firm or corporation, if he sees patients in the capacity of physician, surgeon or obstetrician, he is continuously coming in contact with matters which involve him in legal responsibility in one form or another.

I have attempted in previous papers to show that physicians are constantly involved in contractual relationships[1]; that they are at all times in danger of being involved in malpractice litigation[2]; that they may be compelled to give, without suitable compensation, what they have a right to consider their own property[3]; and in the following discussion I believe I show that they *may* be held liable, on any one or more of three counts, if they publish or show pictures, portraits or likenesses of patients.

The question as to whether or not we make ourselves liable for damages when we show or publish recognizable photographic or other likenesses before or after treatment, cinematographic films of operations, roentgenograms, etc., of patients has not been the cause of frequent litigation in the courts of this country; but it has arisen in this way often enough so that we should be on our guard. In my opinion it behooves us to look well each morning toward the rising sun so that we may see what that day may bring us in the form of additional grief.

Suits for damages resulting from the unauthorized publication of photographs, have been predicated on one of three theories or combinations of them, namely:

1. That the published photograph was a libel, because it exposed the person whose likeness was so published to ridicule, hatred, scorn and public ignominy.
2. That the publication was a trespass upon the hypothetical right of privacy, a right that is inherent in every individual.
3. That the publication was a violation of the law relative to privileged communications, in states where such privileged communication laws were in force.

WHEN the cause of the legal action has been based upon the claim that a publication was libelous, something more than the mere publication of a statement, picture or likeness must be proved. It must also be proved that the publication is in connection with matter that is manifestly libelous on its face, or that it can be shown to be libelous by reason of inference that may reasonably be made by disinterested third parties. And if the picture or likeness published be in connection with any such libelous matter, it is not material that the likeness be accompanied by name or title other than that of the person portrayed, or even that it carries no name at all.

Legally, libel consists of the publication of malicious statements, pictures or caricatures with intent to expose persons or institutions to ridicule, contempt, scorn or public hatred, and thereby to provoke them to anger; in that manner causing a breach of the peace, and injury to the reputation, occupation, business or means of livelihood of the person, persons or institution so libelled.

The principal difference between libel and slander is that in libel the defamation, representation or characterization must have been made or effected in writing, printing, picturing, caricaturing, or in some visible and/or understandable manner; while in slander the offense may be committed orally, or by word of mouth only.

In libel, publication is held to have taken place if the libel is seen by any other person other than the person libelled.

The law differentiates and distinguishes between defamatory, seditious and obscene libel. Defamatory libel may give cause for civil proceedings against both the publisher and the writer of the alleged libel; but to come properly under this classification, it is essential and necessary that the libel charged be false, untrue, malicious, and have a tendency to provoke contempt and/or hatred, and that it be not privileged. Maliciousness is presumed by the law in every such injury which is intentionally produced without due justification.

In criminal law, it is a misdemeanor punishable by fine, imprisonment or both—depending upon the statutes of the various states—to publish or threaten to publish a libel; or, as a means of extortion, to offer to withhold or abstain from publishing a libel.

A seditious libel is one which is directed against the head of a state, the legislature, the courts of justice, etc., and its publication likewise constitutes a misdemeanor punishable in accordance with the statutory provisions of the state where it occurs.

Obscene libel is such a publication containing obscene as well as libelous material. Persons convicted of obscene libel are liable to imprisonment at hard labor in most states in this country.

If the statements or charges contained in the libel are true, suit for damages can not usually be maintained; but the truth of the libelous matter is considered as no defense at common law. However, conviction under these conditions generally secures for the defendant the merciful consideration of the court.

When the defendant is found guilty in a civil suit for libel, the amount of the damages is fixed by the jury; but in a criminal libel suit the jury may only acquit or find the defendant guilty, and if the verdict is that of guilty, it becomes the duty of the court to pass judgment and fix the punishment.

The more recent decisions and legislation in regard to libel have a decided tendency to limit liability to only false, malicious and scandalous

1. Physicians and Contracts, *Clin. Med. & Surg.*, XXXIX:39:604-608.
2. Medical Malpractice, *Am. Med.*, XXVII:7.
3. The Expert Witness Fee, *Am. J. Phys. Therapy*, December, 1928.

libels. Consequently, truth if published without evil intentions or motives and in pursuit of justifiable ends, although the statements made may later be proved untrue, is usually admitted in the courts as a defense worthy of serious consideration.

The Pavesich case[4], is referred to in several supreme court decisions and is apparently considered as a leading one. In it, the Georgia Supreme Court said: "The petition contained two counts, one for a libel and the other for a violation of the plaintiff's right of privacy. The court considered that the plaintiff was entitled to have the question of libel submitted to the jury. The court further considered that the right of privacy count was not subject to a general demurrer as not setting forth a cause for action."

Beside confirming the charge of libel, the foregoing quotation from the decision cannot be taken as other than a full and complete recognition of the right of privacy as a substantive right, and it has been accepted as such recognition by various other state supreme courts.

THE second cause for legal action is that of trespass on the right of privacy, and this involves a comparatively new legal principle concerning which a very considerable amount of legal discussion has occurred, and upon which there appears to be a notable difference of opinion.

What is termed the right of privacy, on which some of these actions have been based, is the hypothetical right of every person to live his own life free from public gaze or insight, or public interference with his purely personal affairs—except of course so far as such public insight, gaze or interference may be warranted or occasioned by the public interest, or public welfare, or by the public nature of the position, office, calling or profession of the person or corporation so portrayed.

The theory that the right of privacy has been indirectly, and should be directly, protected by the courts, had its primary origin in "The Right to Privacy," a paper by Samuel D. Warren and Louis D. Brandeis (now of the United States Supreme Court)[5], published in 1910. This paper was the cause of much and greatly diversified discussion, during which it was designated "a fountain head of discussion, comment, criticism, litigation, and perhaps even of legislation." Since the last quotation was written it *has* been the cause "even of legislation" in New York.

The authors, in the original paper, pointed out that an action of tort for damages lies in all cases for the violation of the right of privacy without showing special damages.

It might be well to remember here that special damages may be of two kinds. In one instance, special damages must be shown before there is a substantive right for legal action, while in the other, and this is the usual use of the phrase, special damages are additional damages over and above the ordinary loss which the plaintiff in the suit has sustained. It is the first mentioned instance to which reference as to special damages for either libel or slander or the violation of the right of privacy applies.

Regarding this notable paper, Roscoe Pound[6], Dean of Harvard Law School, said: "What may almost be called the classical example of creative activity is the paper 'The Right to Privacy' in which Mr. Justice Brandeis, then at the bar, was a collaborator. A bit of puristic reasoning on the analogy of the legal rights that secure other interests of personality, showing that there was an interest in or claim to privacy as a part of personality, and postulating a legal order that secures personality completely, created first discussion, then a conflict of discussions and finally through a decision or statute, a new chapter in the law of torts."

The fact that there is some conflict in the opinions of the courts of several states as to the legal or logical existence of any such right makes it all the more important that we, as directly interested parties, make ourselves more familiar with this subject so that we may discuss it and keep informed in regard to it.

The Supreme Courts of Georgia, Kentucky, Louisiana, Kansas, Missouri and Maine have recognized the legality and existence of the right of privacy. Courts in Michigan, Rhode Island, New York and Washington have denied the existence of that right. Immediately after the New York Supreme Court denied its existence, the legislature enacted a statute recognizing it, which is now in force; while in Michigan[7], the right of privacy was recognized in a suit against a physician, wherein a slight stretch of the legal points involved, altogether probably would make this decision apply in this contention.

A case which attracted much attention at the time it was tried is one which was brought up in Savannah, Georgia[8], wherein a child, born with a developmental defect of the anterior thoracic wall so that the heart was visible, was taken to a hospital, where it died. The hospital authorities permitted photographs to be made of the infant's dead body and copies of these were published in the local newspapers.

Suit for damages was brought against the hospital by the parents of the child, charging a violation of the right of privacy, and their "right to have the extrinsic facts of the case kept secret and the child kept unexposed to the public gaze and comment." A judgment was rendered in the trial court against the hospital, and after appeal it was affirmed by the Georgia Supreme Court.

THE recent filing and rather hurried settlement out of court, by the payment of a considerable amount of money, of a suit in which a physician was charged with showing a motion picture of a Cesarian operation, makes this so much a live subject that it must be apparent to all at all interested that we should look around us and determine exactly where we stand.

In this case the plaintiff's petition read as follows:

"Plaintiff further states that on or about the . . . day of . . . 19 . . . , she was pregnant with child, and that the defendant, as a physician and surgeon, examined her and informed her that she could not give birth to said child by natural birth, and that it would be absolutely necessary for the purpose of preserving her life and the life of the unborn child, that a Cesarian operation be performed upon

4. *Pavesich v New England Life Insurance Co.*, 50 S. E. 68; 122 Ga. 102; commented on in 3 Michigan Law Review, 559 and in 18 Harvard Law Review, 625.

5. The Right to Privacy, WARREN and BRANDEIS, 4 Harvard Law Review, 193.

6. POUND, ROSCOE: Interpretations of Legal History, p. 137.

7. *DeMay v Roberts*, 46 Michigan, 169.

8. *Bazemore v Savannah Hospital*, 155 S. E. 194.

her; that having confidence in the defendant as a physician and surgeon, and believing what he told her to be true, the plaintiff consented that a Cesarian operation be performed, by which operation an incision was made in the plaintiff's abdomen and the child removed through the abdominal incision.

"Plaintiff further states that the said operation was performed on the . . . day of . . ., 19 . . ., and that prior to performing the operation, defendant requested of plaintiff that he be permitted to take motion pictures of said operation, and assured the plaintiff that if she would permit said pictures to be taken, that said motion pictures would never be displayed in public, but would only be displayed to and before physicians, for the advancement of medical science.

"That in reliance upon the defendant's assurance, she permitted pictures to be made of said Cesarian operation, and on the said . . . day of . . ., 19 . . ., said operation was performed, and motion pictures taken thereof; that said motion pictures taken of the operation fully disclosed the body of the plaintiff throughout the operation, and fully disclosed the plaintiff's face and features, so that anyone viewing the pictures can readily recognize that plaintiff is the subject of the operation.

"Plaintiff further says that in violation of the understanding and agreement made in reference to displaying the pictures, and in violation of the plaintiff's right of privacy, the defendant, on or about the . . . day of . . ., 19 . . ., and at divers other times prior and subsequent thereto, displayed said motion pictures of the operation at the. . . . A . . . Club, where said pictures were projected upon a screen before a large and varied audience of people from every walk of life; that anyone who desired to enter the building and see the pictures was permitted to so enter, and many, many persons, not physicians, were permitted to and did enter said building and viewed said pictures.

"That in connection with the exhibition of the said pictures, there was shown and projected upon the screen, a statement to the effect that the plaintiff had never prior to the said Cesarian operation, given natural birth to a child, and had never since said Cesarian operation given natural birth to a child, all of which statements were untrue and false, for the reason that plaintiff had prior to the said Cesarian operation given natural birth, and has since said Cesarian operation given natural birth to children who are now living, and that the publication of said statements were false, slanderous and libelous.

"Plaintiff says that the publication of said pictures were malicious and wrongful and tended to bring the plaintiff into ridicule before the world, and before her friends and acquaintances, and that the said publication is a trespass upon the plaintiff's right of privacy, and was caused by the breach of confidence and trust reposed by plaintiff in the defendant.

"That on account thereof, plaintiff has been damaged in the sum of $50,000.

"Plaintiff further says that on account of the publication of said pictures being wrongful, wilful and malicious, she is entitled to recover punitive damages against the defendant in the sum of $50,000, and for her costs in this behalf expended.

"SECOND COUNT. Plaintiff for further cause of action against the defendant states that she adopts all the allegations of the first count of this petition, and for further cause of action states that the act of defendant in publishing in connection with the exhibition of motion pictures of the Cesarian operation of her, the statement that 'plaintiff had never before said Cesarian operation given natural birth to a child, and had never since said Cesarian operation given natural birth to a child' was wrongful, wilful, false, malicious and untrue and constitutes a libel upon the plaintiff.

"That on account of the publication thereof to the world, which said statements tend to bring her into contempt and ridicule, plaintiff has been damaged in the sum of $50,000 actual damages.

"That because of the wrongful, wilful and malicious publication of the said matter with respect to the plaintiff, she is entitled to recover punitive damages against the defendant in the sum of $50,000.

"Therefore, plaintiff prays judgment in the second count of her petition in the sum of $100,000, and for costs of this suit."

Any physician reading the foregoing petition must know that when a Cesarian section is performed the patient is draped and so covered that recognition would be next to impossible; but the lawyers who drafted the petition did not know that. Likewise the statements about her having borne children naturally before and after the operation, must be taken *cum grano salis*, and again the lawyers did not know that. Nevertheless, there was enough truth to the petition to cause our confrere to settle the case before it came to trial, and at considerable sacrifice.

In what appears to be the leading case[4] relative to the right of privacy, an insurance company published a recognizable picture of the plaintiff in an advertisement, together with statements purporting to have been made by him. The name of the plaintiff did not appear in the advertisement; but the trial court, as well as the Supreme Court of Georgia, held that the plaintiff had cause for action for violation of his right of privacy, as well as for libel. The Supreme Court said, in part: "The right of privacy has its foundation in the instincts of nature. It is recognized intuitively, consciousness being the witness that can be called upon to establish its existence. Any person whose intellect is in a normal condition recognizes at once that, as to each member of society, there are matters private and there are matters public so far as the individual is concerned. Each individual as instinctively resents an encroachment by the public upon its right which are of a private nature, as he does the withdrawal of those of his rights which are of a public nature. A right of privacy in matters purely private is therefore derived from natural law."

The states which have given the right of privacy a common law standing are: Georgia, in 1905 and again in 1924; Kentucky, in 1909 and again in 1912 and 1927; Missouri, in 1911; Kansas, in 1918; and Maine and Louisiana recognized this right under their civil laws in 1906 and 1907, respectively. Michigan (1899), New York (1902), Rhode Island (1909), and Washington (1911) refused to accept it as a common law right[9]. The decision in the New York case was decidedly unpopular and was severely criticized. As a direct and almost im-

9. The decisions of the Michigan and Washington Supreme Courts were severely criticised in 10 Michigan Law Review, 335.

mediate reaction, a statute specifically recognizing the right of privacy was enacted by the New York legislature.

The decisions of the high courts where, in the four states, the right of privacy was refused recognition, stripped of extraneous technical discussion and legal verbiage, appear to base their refusal upon three reasons: *first,* lack of precedent; *second,* presumption that the injury in such cases is essentially to the feelings, for which law according to prevailing opinions and rulings at that time allowed no recovery; and *third,* a fear, both expressed and implied, that the recognition of the right of privacy would tend to bring out a vast amount of litigation.

The foregoing three reasons might be discussed at great length, but as they concern the legal side of this subject much more than they do the medical side, we will not enter into their discussion other than to say that when such legal giants as Pound, Cardozo (now of the United States Supreme Court), Goodrich, Ragland, Chaffee, Long, Walsh, Lawrence, Clark, Bohlen, and others of the same character definitely answer and refute all the arguments against the recognition of the right of privacy and advance arguments in favor of its recognition, who are we, as mere physicians, to say one way or the other.

While it may be said that the right of privacy has been slow in gaining recognition by legislation and the enactment of statutes specifically recognizing it, the common law principle brought out by the original paper of Warren and Brandeis, and the "judge-made law" resulting from the growing number of decisions, is sure to bring the right of privacy to be more and more recognized as time passes.

The first Louisiana case[10] was decided in 1907 under the civil law. Here the Louisiana Supreme Court held that an injunction restraining a police officer from placing the photograph of an unconvicted prisoner in a rogue's gallery was properly granted. That court said: "Every one who does not violate the law can insist upon being let alone (the right of privacy). In such cases the right of privacy is absolute." Schulman v. Whitaker[11] was substantially a similar case.

The first Kentucky case[12] in which the right of privacy was recognized involved the publication of an alleged testimonial for a well known and much advertized patent medicine. The defendant company was alleged to have published a pamphlet advertizing its products which contained a forged testimonial purporting to have been signed by the plaintiff, Colonel John P. Chinn. This read in part: "I join in endorsing Doan's Kidney Pills . . . A few boxes effectively routed my ailment, and I am glad to acknowledge the benefit I have derived." Colonel Chinn's picture was used and he, incited by the chaff and banter of his friends and the hints and interjacence of others, became justly incensed over the affair and brought suit for $25,000 damages, asserting that he neither signed the testimonial nor authorized the publication of his picture, and that the publication damaged him by bringing him into ridicule. The trial court held that it was a question for the jury to determine whether the plaintiff had been subjected to ridicule, disgrace, odium or contempt, stating that if the jury so found, it would follow that there was a libel and damages would lie. But the court further held that the plaintiff was entitled to recover even though the jury did *not* find that the plaintiff had been subjected to ridicule, odium or contempt, *because of the violation of the right of privacy, whereby recovery may be had without proof of libel and special damages.* It will be observed that this court made a clear and definite distinction between the right of privacy and libel, and showed how these may be applied.

This same case was again before the Kentucky Court of Appeals[13] in 1910, and when the defendants refused to pay the judgment suit was brought in the United States District Court at Buffalo, New York, in 1912[14], where the decision of the Kentucky courts was sustained. Defendants then took the case to the United States Circuit Court of Appeals[15], where the judgment was again upheld.

The second Kentucky[16] case was decided in 1912. This case comes nearer home to us, it having been one wherein a photographer was held liable for the publication of a photograph of the plaintiff's dead monster child (a xiphopagus), contrary to agreement. There were apparently two separate and distinct bases for this decision, the violation of a contract and the violation of the right of privacy. The court considered that if the publication of a photograph of a living person is actionable—and it quoted several decisions which of themselves are of no interest here—the same rule should apply to the publication of a photograph of the dead.

This case was particularly interesting because it gave to the parents of the dead child the right of action, such right being generally considered to be personal and to die with the individual or person involved. But this court evidently—and wisely—considered that the parents as well as the child had a right of privacy which had been invaded and violated; thus indicating in a clear and lucid manner that there are separate rights, one of which is to the child and the other to the parents.

The third Kentucky case[17] involves a physician's garage bill. In that case Brent the defendant had exhibited a five-by-eight feet signboard upon which had been painted the legend: "Dr. Morgan owes an account here of $49.67 and if promises to pay an account settled it, this account would have been settled long ago. This account will be advertised as long as it remains unpaid." It was claimed that because the truth is a defense in Kentucky, and that the statement of the libelous publication was true, this was not actionable. But the Kentucky Supreme Court held that it was a violation of the plaintiff's right of privacy, for which action could be sustained for damages.

In 1911 Missouri recognized the right of privacy in a picture advertisement case[18] somewhat similar to the first Kentucky case[12], and the recent case was settled because of the previous recognition of that right.

In 1918 the Supreme Court of Kansas recognized the right of privacy in a case[19] wherein the

10. *Itzkovich* v *Whitaker,* 39 So. 499; 115 La. 479.
11. *Schulman* v *Whitaker,* 39 So. 737; 115 La. 628.
12. *Chinn* v *Foster-Milburn Co.,* 120 S. W. 364; 134 Ky. 424.
13. *Chinn* v *Foster-Milburn Co.,* 127 S. W., 476; 137 Ky. 843.
14. *Chinn* v *Foster-Milburn Co.,* 195 Fed. 195.
15. *Chinn* v *Foster-Milburn Co.,* 202 Fed. 175.
16. *Douglas* v *Stokes,* 149 S. W. 849; 149 Ky. 506.
17. *Brent* v *Morgan,* 299 S. W. 967; 221 Ky. 765.
18. *Munden* v *Harris,* 134 S. W. 1076; 153 Mo. App. 652.
19. *Kunz* v *Allen,* 172 Pac. 532; 102 Kan. 883.

defendant caused pictures to be made of a lady while she was buying goods in his store, without her knowledge or permission. The motion picture so made was exhibited in a local cinema as an advertisement for the store, causing the plaintiff to bring suit for damages. Obviously basing its opinion upon the decisions in the Pavesich[4] and the Munden[18] cases, the Kansas court held that the plaintiff should be allowed damages.

Another Georgia decision[20] protected the right of privacy of a woman whose stateroom had been entered by the defendant and an attempt to assault made. The importance of this decision apparently rests upon the recognition of the right of privacy as an independant one, separate from the right to be free from assault.

In a New York case[21], the right of privacy was expressly placed on a property basis by an eminent jurist. In a dissenting opinion against the decision of the majority of the New York Supreme Court, Judge Gray said: *"I cannot see why the right of privacy is not a form of property."*

REGARDING the abuse or violation of "privilege" by physicians, if we grant that clinical photographs, case histories, roentgenograms, etc., are confidential and privileged communications, we bring to the fore another and to us very important point in connection with this subject.

A physician in permitting the publication of the photograph or other recognizable likeness of a patient may and *in all likelihood does* make himself liable for action for damages, because of his disclosing confidential or privileged communications, in states where privileged communication laws are in force.

Only a few cases appear to have been decided with respect to the extent and nature of a physician's liability for disclosing confidential or privileged communications, or with respect to the nature of enforcement of that liability. Where such cases have been prosecuted and do exist in the records of decisions, they are all combined and associated with the disclosure of information or statements libelous *per se*, so that they are not specific in the charges and complaints.

In the celebrated English Playfair case, Sir William Smoult Playfair, (1836-1903), a physician and originator of a one-time famous rest, regimen and dietary treatment, was sued for damages for libel by a Mrs. Kitson, because of a disclosure involving an imputation of adultery. The imputation of adultery against a married woman would, of course, be actionable for libel, quite aside from any breach of professional secrecy on the part of the physician making such disclosure. The verdict was against the physician defendant, and the damages were fixed at £1,200.

Two American cases, more to the point, imply that under certain circumstances patients can maintain suit for damages against physicians for the disclosure of privileged or professionally confidential communications.[22]

Some 30 years ago, the writer was instrumental in placating, and acting as a pacifier between, two potential plaintiffs in suits against two different physicians, who had inadvertently "told tales out of school," revealing information that was of privileged character. In both of these instances, I acted as arbiter for both the physicians and the patients and happily was able to satisfy both sides that they were equally in error.

From the foregoing we make the following

Summary:

FIVE state supreme courts, having recognized the right of privacy as a substantive right, have rendered decisions to that effect; such recognition being based largely upon the arguments and reasons presented by Warren and Brandeis in their original presentation of the subject. Contrary to these five states, four other state supreme courts have decided to refuse the right of privacy as a substantive right; but one of the latter four (New York) immediately enacted a statute recognizing that right.

It appears that the refusal of the four courts to recognize this right is based largely upon the lack of precedent; the fact that the injury in such cases is essentially an injury to the senses and feelings, for which the law is supposed not to allow recovery, according to the prevailing present rule; and because it was the apprehension and fear of some of the jurists who wrote the decisions that recognition of the right of privacy would result in an enormous increase in the amount of litigation. While the writer does not for a single moment want to appear to pose as an authority in law, it nevertheless seems that the eminent judges who advanced those reasons were lacking and destitute of good reasons. However, being only a physician, perhaps I had better stick to medicine, and from all of this present the following

Conclusions:

PHYSICIANS should be exceedingly careful not to lay themselves liable to action for the violation of the right of privacy, by:

1. Not exhibiting recognizable photographs or other likenesses of patients without their consent.

2. Being very careful when describing cases, even to colleagues, not to lay themselves open to action for libel.

3. Being more than ordinarily careful regarding the disclosure of privileged or confidential communications.

4. Being careful and cautious at all times to respect what is sure to become more and more recognized, the right of privacy—and consequently more and more used as a cause for action by the sort of people who sue members of our profession.

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20. *Byfield* v *Candler*, 125 S. E. 905; 160 Ga. 732.
21. *Schuyler* v *Curtis*, 42 N. E. 22; 31 L.R.A. 286, 293.
22. These are: *Simonsen* v *Swenson*, 177 N. W. 83 (Nebraska), and *Kenny* v *Curley*, 95 So. 34 (Alabama).

Other leading cases based upon the theory of libel are:
Peck v *Tribune*, 214 U. S. 185.
Wandt v *Heart's Chicago American*, 6 L.R.A. 919.
Clary Squire v *Press Publishing Co.*, 79 N. Y. 1028.
Morrison v *Smith*, 62 N. Y. Supp. 166.
DeSando v *New York Herald*, 86 N. Y. Supp. 111.
Farley v *Evening Chronicle Publishing Co.*, 113 Mo. App. 216.
Munden v *Harris*, 134 S. W. 1076; 153 Mo. App. 652.

Discussions of the right of privacy, out of court:
The Right of Privacy, Ragland, 17 Kentucky Law Journal, 85.
The Right of Privacy Today, 43 Harvard Law Review, 297.
The Right of Privacy and Equity Relief, Edwards, 55 Central Law Journal, 123: 3 Michigan Law Journal, 559: 2 Colorado Law Review, 437.
The Right of Privacy and Its Relation to the Law of Libel, 39 American Law Review, 37.
The Right of Privacy Today, Roy Morland, 19 Kentucky Law Journal, 101.
The Right of Privacy: A Contra View, Rufus Lisle, 19 Kentucky Law Journal, 137.
Interpretations of Legal History, Roscoe Pound, 137.
Equitable Relief Against Defamation and Injuries to Personality, Roscoe Pound, 29 Harvard Law Review, 640.
On the Objection that a Recognition that the Right of Privacy Would Open the Floodgates of Litigation, 17 Kentucky Law Journal, 85; 3 Michigan Law Review 559.
Emotional Disturbances as Legal Damage, Goodrich, 20 Michigan Law Review, 497.

Chicago Tribune of January 13, 1934, contained an item headed "Pick Head From Crowd Photo for Book Jacket: Rabbi Sues Publisher," and a telegram from London, dated January 12: "The picture of a bearded Jew on the paper jacket of the recently published book, 'Jew at Bay' has resulted in a damage suit against Philip & Alan, publishers. The head was selected from a crowd picture taken at random around a soap box orator in Hyde Park. It was seized upon because it was thought to be replete with radical characteristics. Now steps forward one Rabbi Reubin Eichenstein, well known in the Jewish quarter in west London, who says that the picture is of him. Moreover, readers claim the picture on the jacket jibes with the character in the book. The firm withdrew all the jackets they could find, but the Rabbi is pressing the suit." While the foregoing is only a newspaper story and must therefore be taken with several grains of salt, it strongly suggests that there is some basis in England for an action of the sort under discussion in this paper.

VERDICTS OF GUILTY and recoveries of damages were allowed to plaintiffs for violation of their right of privacy in printing or publishing of their photographs or of photographs of their children without consent, in the following cases:

Chinn v *Foster-Milburn Co.*, 120 S. W. 364; 127 S. W. 476; 137 Ky. 843; 195 Fed. 195; 202 Fed. 175 (Kentucky).
Douglas v *Harris*, 149 S. W. 849; 149 Ky. 506 (Kentucky).
Munden v *Harris*, 134 S. W. 1076; 153 Mo. App. 652 (Missouri).
Brents v *Morgan*, 219 S. W. 967 (Kentucky).
Pavesich v *New England Life Ins. Co.*, 50 S. E. 68; 122 Ga. 102 (See Ref. 4).
Bazemore v *Savannah Hospital*, 155 S. E. 194 (Georgia).
Itzkovich v *Whitaker*, 39 So. 499; 155 La. 479 (Louisiana).
Schulman v *Whitaker*, 39 So. 737 (Louisiana).
Kunz v *Allen*, 172 Pac. 532; 102 Kan. 883 (Kansas).
Byfield v *Candler*, 125 S. E. 905; 160 Ga. 732 (Georgia).

Fractures of the Os Calcis

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THE longitudinal arch of the foot has for its posterior base the os calcis, and for its anterior base, the heads of the metatarsal bones. On the inner side, the highest point of the arch is at the junction of the astragalus and scaphoid, and on the outer side it is at the calcaneocuboid juncture. The latter point is at a considerably lower level than the former is, and this arrangement forms a semidome. The foot will tolerate a gradual lowering of this arch fairly well, but any sudden lowering, as a result of trauma, is always attended with distressing symptoms. Fractures of the os calcis may lead to such an abrupt lowering of the arch and to such an alteration in the semidome shape that great disability will ensue.

Statistics

BASED on 54 cases observed at the Clinic: I am presenting no anatomic classification as this has already been well done in textbooks. I will not attempt to estimate the average length of disability, because after a review of our records I was so much at sea because of the multiplicity of factors to be considered that I realize the futility of such an attempt in considering this particular phase. In 22 cases of fresh fractures of the os calcis, 20 of the patients were males and two were females; three patients had double fractures, making 25 fractures in all. Seventeen of the fractures were the results of falls. Two of the patients who had double fractures were injured by an explosion from below the floor on which they were standing. One fracture was the result of an automobile accident, and in two instances the type of injury was not recorded. In six cases the results were not known. Three of the fractures were compound. In seven cases the results were excellent; the patients returned to full duty in three to four months. In six cases the results were classified as good; the patients were able to carry on although they had some pain and discomfort. In two cases the results were only fair but at the end of a year the patients were able to get about and carry on. These results are better than one would be led to expect from the literature. This was not because of any specific type of treatment. The majority of the fractures were treated with plaster of Paris casts which were applied after molding the fragments. The chief reason is that the length of time is not taken into consideration and that few were industrial cases. As long as six years has elapsed in some cases since the accident and, although the result would have been classed as fair or perhaps poor when the patient first resumed work, gradual improvement has taken place. The return to duty was undobtedly delayed in cases in which patients received compensation insurance, and improvement took place more slowly in those cases in which a job did not await the patient than it did in the cases in which a job was available. Eleven of the 22 patients were more than 50 years of age. The severity of the fracture, particularly in regard to the amount of crushing of the bony architectural structures in the body of the os calcis, is most important.

I would like to mention briefly the 32 patients who came to the clinic because of old fractures of the os calcis. The length of time which had elapsed between the occurrence of the fracture and our examination varied from 12 weeks to 26 years. There were no women in this group. Five of these patients were more than 50 years of age, 14 were between 40 and 50 years, nine were between 30 and 40 years, and four were between 20 and 30 years of age. The cause of the late disability in 21 of these cases was recorded as astragalo-calcaneal traumatic arthritis. Arthrodesis was advised in 14 cases, but only three patients were operated on. The reason why so few accepted this advice, I believe, can be accounted for in three ways. First, the disability was of long duration and the patient could get about. Second, the patient dreaded the complete disability, which would last for three months and perhaps longer if arthrodesis were performed with the consequent loss of earning power and the expenses incidental to such a procedure. Third, and most important, the majority of the patients felt that they were slowly improving.

Length of Disability

I THINK it may be safely assumed that compensation insurance has definitely prolonged the disability which follows fractures of the os calcis and, therefore, this fracture perhaps has received a blacker name than it deserves. This situation prompted Conn, of Akron, Ohio, to advise his admittedly complicated program to shorten the disability. He advised, for the treatment of recent fractures, immediate manipulation and skeletal fraction for reduction, to be followed five weeks later by astragalocalcaneal, astragaloscaphoid and calcaneocuboid fusion. In cases of old disabling fractures, he is of course advised only the triple fusion.

Treatment

COMPLETE reduction of the fracture is not easily secured, for there is generally a great deal of comminution and a certain amount of irreparable crunching of the bony substance. We have used a method described by Gillette some years ago, which consists of putting a nail or Kirschner wire through the distal portion of the

• Abstract of paper read before the American Association of Railway Surgeons, Chicago, November 7, 1936.

fracture just below the insertion of the tendo Achillis. Then, over this transverse wire or peg is inserted the threaded arm of a crutch-like arrangement on which is a set-screw. This threaded arm fits into metal canals incorporated into a cast, and by adjusting the set-screw pressure can be made downward on the wire or peg, thus forcing downward the displaced fragment. The counter pressure is obtained by extending the cast well up onto the thigh with the knee flexed to a right angle, being careful to pad with heavy felt so that undue pressure will not be put on the popliteal space. Gillette, in later years, has changed as has Conn, the means for obtaining counter pressure by putting a pin through the tibia and incorporating it into the cast. These procedures after all are somewhat complicated, and the probabilities are that the majority of patients will still be treated by manipulation and casts.

Reconstruction of Old Fractures

A COMMON deformity seen following old fractures of the os calcis is a protuberance or exostosis on the inferior surface. Smoothing this down by chiseling it away helps materially. With the foot in the valgus position, an extra amount of callous may form at the fracture line, just beneath the external malleolus on which it may impinge. By chiseling this away the pain is often relieved. When the distortion of the os calcis is so extreme as to alter weight-bearing lines seriously, an arthrodesis may be performed. Arthrodesis of the astragalocalcaneal joint is not sufficient. A triple arthrodesis such as we use in flail feet due to infantile paralysis should be performed at the astragalocalcaneal, the astragaloscaphoid and the calcaneocuboid joints. This prevents lateral motion of the os calcis on the astragalus but allows dorsal and plantar flexion of the ankle joint without hindrance.

Medicolegal Cases

—Abstracts of Court Decisions—

Book Review by

C. O. Sappington, M.D., Dr.P.H.

THIS volume covering abstracts of court decisions in medicolegal cases during the period 1931-1935 was compiled by The Bureau of Legal Medicine and Legislation of the American Medical Association, and is complementary to a previous work covering abstracts of decisions during period of 1926-1930.

Of particular interest to industrial physicians and surgeons in the course of their work in medicolegal cases, will be the citations under the general heading "Workmen's Compensation Acts." This material includes various types of injuries and occupational diseases, the latter representing a larger number of cases than ever before published in one volume. For example, reference is especially made to benzol, carbon monoxide, hydrogen sulphide, lead, sodium fluoride, sulphuric acid, zinc, mercurial poisoning, methyl alcohol, asbestosis, silicosis, dermatitis, and undulant fever.

In addition to the index of general subjects at the end of the book, there is an alphabetical table of cases, with citations referring to the Reporter System.

Perhaps a paragraph from the preface expresses more accurately and forcefully the intended use of this volume than the reviewer can: "It has been said that a man who acts as his own attorney has a fool for a client. The idea prompting the publication of these abstracts in *The Journal* and in book form is not to qualify physicians to assume the role of counsel for themselves or for others, but rather to aid them in avoiding some of the legal and medical pitfalls into which their fellow physicians have fallen and to exemplify the medicolegal problems that have been before the courts, so that physicians may more intelligently meet such problems when they arise."

In these days of unusual medicolegal experiences, the material gathered in this work should be invaluable to every physician and especially to industrial physicians and surgeons.

The book is done in buckram binding, contains 888 pages, and measures 6 x 9 inches. Published by the American Medical Association in 1936, the price is $5.50. The price of the former issue was $7.00, and the combination may be had for $10.00.

Allergy of the Nose and Paranasal Sinuses

Book Review by

C. O. Sappington, M.D., Dr.P.H.

IN THESE days of rapid changes, the industrial physician and surgeon will find it necessary to become adequately informed on many subjects. Allergy, in its many manifestations, is one of the fields involved.

This work written by Dr. French K. Hansel is best described by the author's own words in the preface: "The object of this monograph is to familiarize the otolaryngologist with the clinical features of allergy as related to the field of otolaryngology, to review the various phases of the subject itself, and to point out the frequent association of the nasal with the other manifestations, particularly asthma, gastro-intestinal allergy, allergic skin diseases, and allergic headache. The monograph also serves the purpose of familiarizing the allergist and the pediatrician with the otolaryngologic phases. The subject matter is approached primarily by the consideration of the fundamental principles of physiology, biochemistry, and bacteriology of the secretions, the cellular reactions of the tissues in allergy and in immunity, and the histopathology of allergy, as they relate to the nose and paranasal sinuses. Allergy in general and subsequently the clinical aspects of the manifestations in the nose and paranasal sinuses are reviewed in detail. A consideration of the other manifestations of allergy as they are commonly associated with nasal symptoms is presented statistically . . ."

This book should be of great value as a reference work to the industrial physician and surgeon who is being constantly called upon for an ever-widening collection of information, which actually dips into all the ramifications of medical and surgical processes.

The volume contains 821 pages, with 58 text illustrations and three color plates, published by the C. V. Mosby Co., St. Louis, Mo., 1936, and is priced at $10.00.

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Penumbra!

THERE has been among industrial physicians and surgeons in recent months, no little concern lest their employer affiliations on a full time or other basis be classed as "contract medicine," and thus come in for the rather severe indictments of that form of practice which are made from time to time.

Contract medicine, as such, has attracted strong criticism. And there can be little doubt that, in many of the manifestations which gave it the name, it deserves to be criticized. But some of the criticisms include expressions which, without limiting their applications—without, as it were, defining the target at which they are aimed—carry implications that seem to besmirch whatever they may hit. For example: "Contract systems are now operated more often to reduce compensation costs, absenteeism, labor turnover, inefficiency and wage payments than to supply needed medical service." And: "Contract practice always is restricted to a selected group—generally of adult employees." And: "Contract medicine is almost exclusively curative medicine. It gives little attention to prevention."

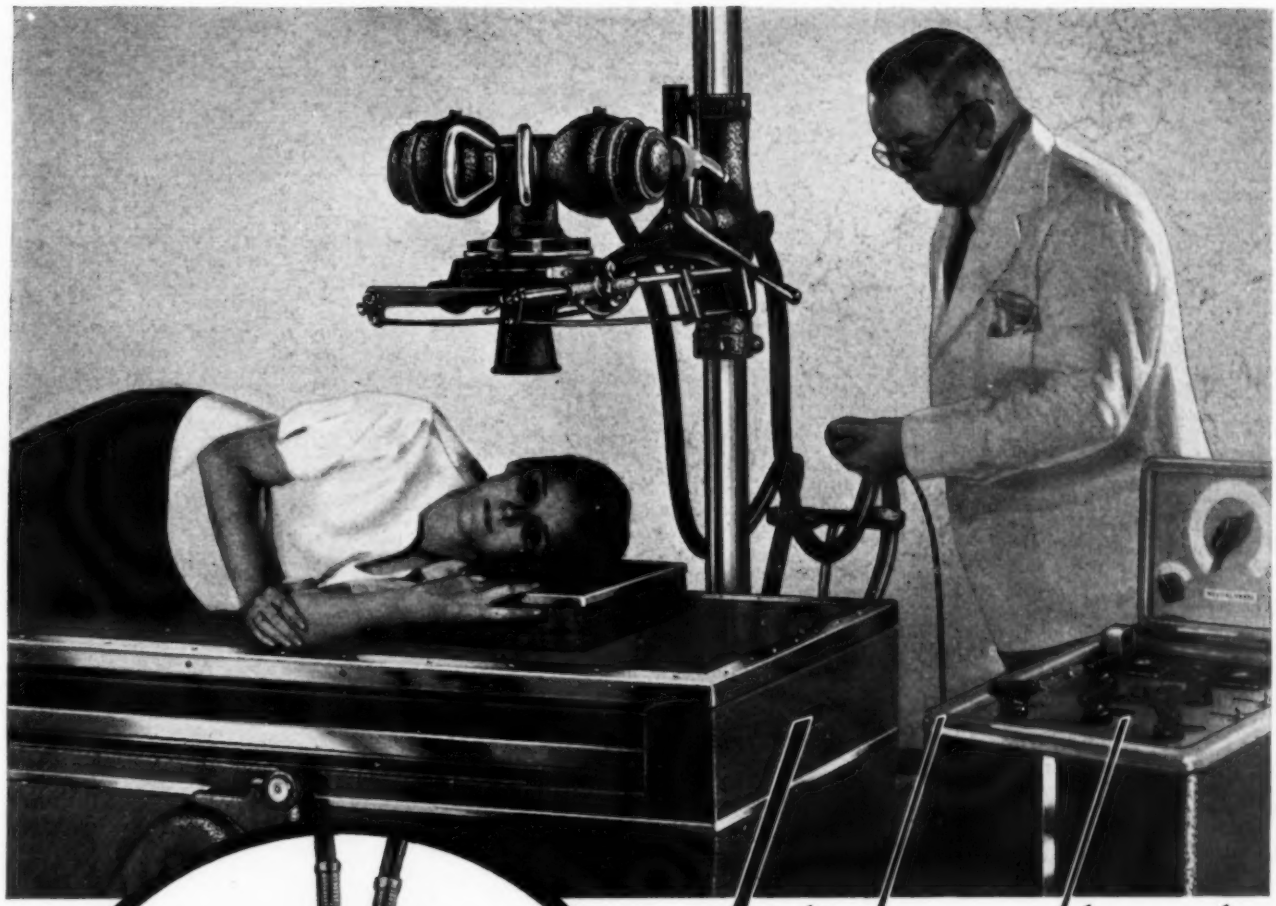
Medical services in industry *have*, as their economic objectives, the purposes to "reduce compensation costs, absenteeism, labor turnover, inefficiency . . ." (we omit "wage payments"—because we think that phrase must have been put in "just to made it hard"). And medical services in industry are usually, although not always, "restricted to a selected group," the employees.

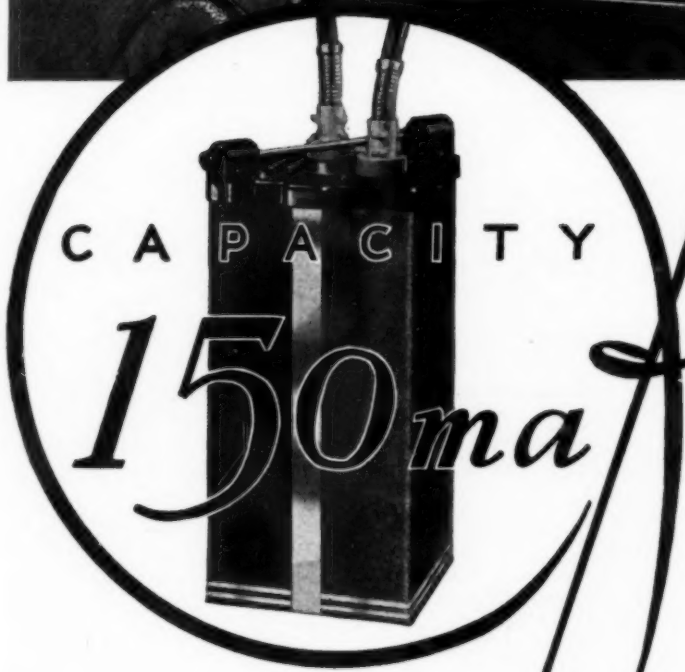
This gives rise to many thoughts: Why not? How could it be otherwise? Compensation, absenteeism, labor turnover, inefficiency, cannot be indulged in for nothing. They cost money, which someone must pay. As to compensation, the law says the employer is the one who foots the bill; as to the others, the economics of competitive existence place the burden likewise upon the employer. Foolish, indeed, would he be to continue paying them in any aggregate and not try to find a way to reduce their amount! How long could he remain an employer if he did? And why expect him to extend the remedial measure, of a medical department, to others than those in his employ? Why criticize him for not paying someone's doctor bill toward whom he sustains no relation at all? Is more to be expected of him in this respect than of any other person? Regarding the general subject of "curative" vs "preventive," why not criticise the doctor for his lack of prevention in respect of automobile accidents? And many more questions . . . all of which, extended even a little way along their logical course, lead to the conclusion that the industrial physician and surgeon who lets himself be bothered by any criticisms of "contract medicine" is sensitive where he should not be, or feeling a hurt where none was meant.

Industrial medicine is not contract medicine, and the fact that it has done, and is doing, in a thoroughly creditable manner some of the things that "contract medicine" is accused of attempting in a discreditable manner does not make it such. To the industrial physician and surgeon, therefore, we say: Get out from under that aura of possible shadow which in times past was wont to lurk about the term "industrial." Some of the best brains, and the highest ethics, in medicine have long since emerged from it, into the clear field of the finest kind of professional work. And to the critics of contract medicine, we suggest that they remember, and make it clear, that it is not so much the doctors who need to be criticized as it is the employers—and, indeed, the insurance companies—who need to be educated!

Friend, Adieu!

ONE by one our friends are taken, each with his summons "by the same post as the other." One by one they heed the call, and put aside their work, and are gathered to their fathers. And when they are gone we pause a moment, in regret, in tribute, and—whether we admit it or not—in wonder. Individualists we are, and materialists, knowing most intimately those we knew in the contacts which present the pathology of material, and come to their end in the pathology of the dissolution of that material. But is that all? Within the structure of elements and cells that made the man, what was it made the *man?* Is the individual span a candle flame, guttering to final extinction in its fleshly sconce? Or is it the cycle of a wheel, which, having made one turn, is ready for the next? Nothing that is understandable in terms of pathology can answer. Nor, indeed, are the terms of other sciences more eloquent. The life is gone, and all of science has no more to say. But when it is a life we knew and respected, we pause—hoping we have only said "adieu." And thus, whether we acknowledge or deny, we have stood a moment at the threshold of faith.





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Occupational Diseases and Industrial Surgery

Silicosis Hazard in American Industry

DURING the past year front page stories about workers who contracted silicosis while excavating the water tunnel at Gauley Bridge, West Virginia, have made the public conscious of the hazards of industrial dust.*

Although silicosis was news to most people, the dangers of dust inhalation have been known for several centuries. Georges Agricola, a mining engineer of the sixteenth century, in his book "De Re Metallica," described dust conditions in dry mines and warned that dust "penetrates into the windpipe," and "eats away the lungs and implants consumption in the body."

Prior to 1900 there is little mention of pulmonary fibrosis or silicosis in American medical literature. In 1907 Dr. F. L. Hoffman, statistician of the Prudential Life Insurance Company, published the first significant American study of the subject. He emphasized the importance of dust as a factor in occupational mortality. In 1915, stimulated by the studies of the South Africans on silicosis in gold mining, Edwin Higgins of the U. S. Bureau of Mines and his associate, Dr. Anthony J. Lanza, published a paper on pulmonary disease among miners in Joplin, Missouri. The contributions of Hoffman and Higgins and Lanza, mark the real beginning of our knowledge of the disease in this country.

Since 1915 research studies on the effects of dust inhalation have been conducted in the laboratory, in the clinic and in industry; and engineers have worked on the problem of silicosis prevention by controlling dust dissemination in the workroom air. While our knowledge of pulmonary disease produced by dust inhalation is by no means complete these laboratory and field studies have gone a long way toward clarifying our understanding of the effects of two kinds of dust on human and animal lungs.

Dangerous Dusts

THE first of these dangerous dusts is quartz (crystalline silicon dioxide), the inhalation of sufficient amounts of which produces silicosis. The second dust capable of doing pulmonary damage is asbestos and the disease it causes is known as asbestosis. The facts about other dusts are not clearly established, and any conclusions as to their effects must still be viewed with caution.

When fine quartz dust is inhaled after passing the defenses of the upper respiratory tract it reaches the terminal air sacs of the lung where the exchange of gases between the blood and air takes place. At this point the dust, being foreign matter, is ingested by scavenger or dust cells which carry it through the walls of the air sac to the lymph drainage canals just outside the air sacs. Normally it is along these canals that foreign substances are carried from the air cells to lymph tissue in the lung or at the point where the windpipe enters the lung itself. But when silica is being removed the particle kills the scavenger cell which is transporting it, with the result that the dust particles are not all removed from the lung substance. Instead they may be found along the course of the drainage canals and in the small aggregations of lymph tissue along these canals. If no further change in the lung resulted probably all would be well. But apparently these small particles of quartz dust in their new location are highly toxic to the tissue cells in their immediate vicinity for these cells are altered and replaced by scar or fibrous tissue. This scar tissue does not possess the properties of normal lung tissue; through it the normal exchange of gases between the air and the blood cannot take place.

With the continued inhalation of quartz dust the amount of scar tissue increases and finally encroaches on the normal air sacs to such an extent that the lungs cannot oxygenate sufficient blood to supply the body's needs. The victim then finds himself short of breath—at first only when doing heavy work, then at moderate tasks and finally even when at rest.

After silicosis has made marked progress, tuberculosis frequently develops. Just why or how the lungs become infected is not now known, but the fact remains that many cases of advanced silicosis terminate with a tuberculous infection.

A Chronic Disease

THE terms "chronic" and "acute" used in reference to disease are often misunderstood. By an acute disease is meant one which develops in a relatively short time, a matter of days or weeks, while a chronic disease runs over months or years. The development of silicosis is a matter of many months, in most cases of years. It is obviously a chronic disease.

Since inhaled quartz dust is the causative agent in producing silicosis and since silicosis is a chronic disease, it follows that the more quartz dust inhaled the more rapid the rate of the disease's development. A person exposed to a dust containing 95% quartz, as in sandblasting castings, is exposed to a greater risk than the worker in a coal mine where the quartz concentration may be only 2 or 3%.

A second controlling factor is the duration of exposure. It is obvious that in two years of occupational exposure a worker will inhale about twice as much quartz dust as in one year in the same employment.

The third major factor in determining the amount of quartz taken into the lungs is the concentration of dust in the atmosphere. If we examine workers in a very dusty establishment and those in a less dusty plant and study our results, we shall find that in the first group silicosis supervenes earlier in occupational life, and the rate of silicosis incidence is higher than in the second group, comparing workers employed equal lengths of time.

In considering the concentrations of dust it must be borne in mind that particles of all sizes may not gain access to the lungs. Only those small enough to reach the terminal air sacs do real damage. These particles range from 1/2500 of an inch down to 1/50,000 of an inch. There is one exception to this statement, asbestos dust, which will be considered later.

In attempting to estimate the silicosis hazard of a given occupation the investigator must always bear in mind these factors: the quartz dust content of the air, the concentration of particles per cubic unit of air, the duration of exposure, the size of the particles present. There is still another important factor, not of the environment but rather of the individual. This is the element of personal susceptibility. It has been noted by many investigators that workers in the same plant, at the same task and at contiguous workplaces or benches often do not develop silicosis in equal degrees. In fact one worker may be an early victim of the disease while his neighbor is comparatively free from it. Personal susceptibility appears to play a major role in the development of silicosis. This angle of the problem presents interesting grounds for speculation and research. The industrial statistical studies discussed later, eliminate the element of variations in susceptibility by including large groups of workers.

Mortality Rates

IN ATTEMPTING to show the influence of dust inhalation on mortality one naturally turns to the mortality returns of the United States, England and Wales. But silico-tuberculosis, as a rule, runs a rapid course terminating fatally, and practically all silicosis deaths are listed as tuberculosis in these tables.

The following table, from the report of the registrar general, presents the standardized respiratory tuberculosis mortality rates for 1921-1923 for England and Wales, and compares the eight occupations having the highest mortality rates from tuberculosis with the rate for all occupied and retired males.

Occupation	Rate per 100,000
All males, occupied and retired..	150
Tin and copper miners, all underground workers	1886
Cutlery grinders	1323
Metal grinders	637
Stone workers and slate workers	512
Potters	411
Barmen	402
File cutters	365

Of the eight occupations listed, all except one are associated with inhalation of quartz dust. It will be observed that tin and copper underground miners have a tuberculosis rate more than 12 times that for all occupied or retired males, and file cutters who work on sandstone grind-

* LEONARD GREENBURG, M.D., Executive Director, Division of Industrial Hygiene, New York State Department of Labor, in *Survey Graphic*, December, 1936; and *The Industrial Bulletin*, December, 1936.

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ing wheels largely composed of quartz have a tuberculosis rate of more than twice that of all occupied and retired males.

American statistics corroborate the findings of the British investigators. Some years ago Dr. William H. Drury, then in the department of public health at Yale, reported a mortality study of ax grinders in a Connecticut factory. With the help of the plant physician who had been there over 20 years, it was possible to corroborate all the death returns for the 20 years 1900 to 1919. The grinding wheels used in this factory were of natural sandstone with a very high quartz content. This table compares Dr. Drury's findings with the tuberculosis deathrates for Connecticut, for the district, and for the other employees in the same plant:

District or Group	Deathrate per 100,000
State of Connecticut	150
State of Connecticut (male population)	170
Ax factory district (3 towns, entire population)	200
Employes of ax factory (all)	650
Employes of ax factory, polishers and grinders	1900
Employes of ax factory, others	160

It will be observed that the tuberculosis rate for grinders and polishers in this ax factory was 12 times that of the other employees of the factory and that the ax factory district had a tuberculosis rate of 200 as compared with 150 for the state as a whole. This table also shows that the contribution of tuberculosis deaths from a local industry or group of industries may adversely affect the mortality rate of a general population group. In other words if the high incidence of tuberculosis associated with certain occupations could be reduced, a reduction might be expected in the general tuberculosis rate for the entire area.

Detailed Studies

THE most valuable silicosis data come from detailed studies in selected industries, but only a few such studies have been made. The U. S. Public Health Service through its publication has made available the greater part of this knowledge in the United States. Among the industries in which the dust hazard has been studied in detail are: the scouring powder industry, granite stone cutting, and silverware.

Some brands of scouring powder contain quartz as the abrasive agent, which may constitute 75% or more of the finished product. The quartz is usually very finely pulverized in order to prevent scratching; hence the dust is potentially very dangerous. Dr. Eugene S. Kilgore, of San Francisco, writing in the "Journal of the American Medical Association" summarizes his experience with cases of silicosis arising in this industry. In one case which resulted after 11 months of occupational exposure, the patient experienced marked shortness of breath in attempting to climb one flight of steps. Dr. Kilgore cites the cases of six employes who worked from 10 to 27 months in this industry, five of whom were dead from silicosis at the time of his publication. This occupation may be regarded as one of the most serious types of exposures, closely paralleling quartz rock and quartz sand grinding. Several years ago cases of silicosis were reported among New Jersey workers engaged in grinding and pulverizing sand. This pulverized material is almost identical with that used in the making of scouring powder, and the sand pulverizers were found to develop silicosis after about two years' exposure.

According to the best available studies, approximately one to two years represents the shortest time required for the development of silicosis. It is conceivable for the disease to develop in a shorter period when exposure to pure quartz dust is encountered but clear cut evidence on this question is lacking.

In 1922 F. L. Hoffman, in cooperation with the National Tuberculosis Association, published the first study of the dust hazard among Barre granite workers. In 1929 after several years of study the U. S. Public Health Service brought out an exhaustive report on the same problem. This study includes determinations of the atmosphere, as determined for workers at different tasks, morbidity and mortality statistics of workers en-

THE BULLETIN

of

The American Association of Industrial Physicians and Surgeons

THE object of this Association shall be to foster the study and discussion of the problems peculiar to the practice of industrial medicine and surgery; to develop methods adapted to the conservation of health among workers in the industries; to promote a more general understanding of the purposes and results of the medical care of employees, and to unite into one organization members of the medical profession specializing in industrial medicine and surgery for the mutual advancement in the practice of their profession.

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gaged at various occupations and x-ray studies of the lungs of workers.

Barre, Vermont, is the center of granite stone industry. Blocks of granite are taken from the quarries, cut to dimensions, surfaced, carved and lettered. This material is used for building purposes and for tombstones. The average quartz content of Barre granite is 35%. The Public Health Service study showed that the dust content of the air varied from five to 48 million particles per cubic foot, depending on the particular industrial process studied.

Tabulated Findings

IN THE following table which presents the findings of this study the workers are grouped in four classes according to dust exposure. The table presents average dust exposures, the period of time in years required to produce early and advanced silicosis and the tuberculosis deathrate for each group. The relationship between the amount of dust, the time required for the production of silicosis and tuberculosis is obvious.

Group	Av. Dust Count	Yrs. to develop Silicosis Early	Yrs. to develop Silicosis Advanced	Tuber'losis Deathrate per 100,000
A	48	2	5	1950
B	35	4	7	1280
C	20	4	9	230
D	5	10	—	—

The silverware manufacturing industry was selected for study by the U. S. Public Health Service in order to obtain knowledge of an occupation for which the dust content of the air was lower than in the granite stone industry, and in which the quartz content was low. In silverware manufacturing the average dust content of the air is about five million particles per cubic foot of air and the quartz content 1.7%. This dust is produced in polishing the product.

The study failed to reveal any cases of silicosis. It is interesting to note that a similar study conducted in textile manufacturing corroborated the silverware manufacturing study in revealing no cases of this disease.

From the foregoing it becomes apparent that silicosis is an insidious disease, its victim often completely unaware of its gradual onset until the final stages have been reached. This slow and unperceived development complicates workmen's compensation. In many states compensation claims must be filed within one year after the onset of disease. Clearly this is impossible in most cases of silicosis, where the date of onset is not known. Further, the unsuspected cases of silicosis make it difficult to set up an insurance scheme covering this occupational hazard because at the inauguration of the program they constitute an accrued liability for which no financial reserves have been set aside.

The labor turnover in certain dusty trades is high. After working in one plant long enough to develop early silicosis, of which they are not aware, workers often transfer to another establishment where, after a relatively brief interval, they are stricken with disabling silicosis. Should the first employer, the second employer or both jointly pay this compensation bill?

A just compensation plan for silicosis victims can only be drawn and administered after careful study of the problem and its many factors. Hasty legislation may produce far-reaching evils.

Incurable

IN VIEW of the fact that silicosis cannot be cured and that the advanced stages are practically always complicated by a terminal tuberculosis, the importance of prevention is apparent. The improved techniques of modern industry were developed in response to a demand for a greater output of fabricated goods and materials. It is important to realize, however, that these production methods have in certain instances increased old health hazards and brought

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about new ones. Studies demonstrate that dust production in granite stone cutting and in rock drilling has been increased tremendously since the introduction of pneumatic tools.

The first method of preventing silicosis is to substitute harmless materials for those known to be harmful. Obviously if we could remove quartz from all industrial operations we could at one stroke eliminate the silicosis hazard. This is, of course, impossible. But it is possible to substitute other materials for quartz in certain industrial operations. Many foundries employ sand (practically pure quartz) in cleaning castings by sandblasting. It has been shown that the substitution of small fragments of steel, known as steel grit or shot may in many cases be used with equal efficiency. This substitution does not completely eradicate the health hazard, since a certain quantity of sand adheres to the surface of castings made in sand models and it is this sand which the cleaning process is designed to remove. Studies reported by Dr. C. E. A. Winslow of Yale University and the writer made in sandblast rooms showed a dust concentration of 970 million particles per cubic foot of air when using sand as the abrasive as compared with 155 million particles when using steel grit.

A second example is the substitution of abrasive wheels made from synthetic abrasives (practically no quartz) for those made from natural sandstone (about 95% quartz), practically eliminating the hazard.

Another method of dust control is by the use of water. This has been done with considerable success in anthracite coal mining, as demonstrated in the following table:

Operation	Dust concentration Millions per cubic foot Controlled	Uncontrolled	Control Measure
Drilling	33	568	Wet drilling.
Loading coal or rock	32	636	Material wetted while loading.
Preparation of coal	24	380	Wet breakers.
Handling coal	1.2	17	Wetting coal and cars.

(Data from U. S. Public Health Service)

The results are obvious—in each case a very real reduction in dustiness by simple, inexpensive means.

A third method of preventing silicosis is to enclose the process as completely as is possible without interfering with work, the worker being outside the enclosure and so removed from the dusty zone.

A fourth method of dust control is to withdraw the dust laden air from the workplace. This is done by providing exhaust hoods or enclosures equipped with suction ventilation.

In certain industrial processes it is impossible to protect the worker by any of these methods. In such cases the workers must wear masks or respirators which filter the dust from the air before it enters the respiratory tract, or use helmets which cover the head and are supplied with clean air through a hose line. But such equipment, while highly efficient when properly maintained, is cumbersome and the worker is apt to find its use a burden. It should only be employed where other methods do not adequately clear the air.

The Association for the Advancement of Industrial Medicine and Surgery
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1937 Annual Meeting, December 15, at Electrical Auditorium, Grand Central Palace, New York City.

Education Necessary

IF EVERY industry today utilized the known engineering means to control dust hazards in shops and workrooms, our problem would not be completely met but certainly we should be a long way toward its practical solution. There is need for a program of education and guidance which will help industry understand the silicosis problem and the most efficient means of solving it. Common lawsuits for damages, the passage of compensation acts, the Gauley Bridge water tunnel and other tragic experiences have served to make employers silicosis conscious. Industry shows an increasing readiness to cooperate in eliminating the dust hazard from its work places.

Progress in the field of public health is, as a rule, not achieved until those vitally concerned become aware of the bearing of a suggested program on their own well being. Publicity and educational effort have thus become vital to the public health movement. Frequently the public is convinced of the importance of public health measures without being aware of educational propaganda. A small epidemic may achieve wide educational results.

It is characteristic of the public health movement that the transfer of information from physicians and research workers to the general public marks the final stage in the conquest of disease. There is great likelihood that this will be proved true once again and that the attack on silicosis which is now developing marks the real beginning of the eradication of dust hazards in American industry.

To Work or Not To Work!

ONE of the dilemmas that confronts the physician is the advice that he should give his silicotic patient about continuance at his work.* The situation here is complicated by various economic considerations and it is not practicable to be too dogmatic in laying down rules and regulations. If the silicotic patient has active tuberculosis, he should, of course, be advised to quit work, both for his own sake as well as that of his fellow employees. If he has a definite silicosis and it is not possible in his present occupation to avoid further exposure to the hazard, evidently his best chance of holding his disease in check is to seek other employment. If, on

* A. J. LANZA, M.D., in *New York State J. Med.*, October 1, 1936; quoted in *Bulletin of the Association of Casualty & Surety Executives*, December, 1936.

the other hand, having been detected by the employer and adequate provisions made to control the hazard, the patient might as well continue in the work for which he is fitted and trained as to seek other employment, particularly if he is along in years. This whole matter of working or quitting work is far from a simple one and calls for very careful and conscientious thought on the part of the physician who is called upon to render a verdict.

Examinations—Legislation

IN THE light of experience thus far developed there are some who deem it advisable that in a plan for compensation there should go hand in hand with all other safeguards to employees a provision for limited physical examinations of those employees who will be exposed to occupational diseases—these examinations to be made when first applying for employment.* Then subsequently interim examinations at intervals of one year during employment, unless otherwise required because of special circumstances in unusual cases, and examinations when leaving employment. If a plan for compensation should require such examinations then they should be conducted by impartial medical boards under the supervision of or in a Bureau of Industrial Hygiene. These examinations should be made solely for the purpose of protecting workers from the hazards of diseases to which they are, or may be, physically disqualified to incur. Physical examinations should never be general in their scope nor required of workers en masse without regard to the special hazards incident to their respective occupations. By no means should these examinations be conducted in an effort to set up selective standards for all workers. The primary and only purpose of such examinations, if provided for in the law under the jurisdiction of a Bureau of Industrial Hygiene, should be only for protection and prevention . . .

It is just as humane and economically as sound to prevent accidents as it is to prevent occupational diseases, yet we must not overlook at least one very important factor, to wit—that many accidents do occur from carelessness of the worker; that undue risks are knowingly assumed by the worker; that in some cases accidents occur because of violation of known instructions and rules. These accidents could have been prevented by the worker himself. Such accidents, however, are generally compensable. But in cases of exposure to occupational diseases there is more likelihood, because of intricate machinery, power-driven tools, intensified chemical processes, with their attendant acute hazards, of the worker not having the least knowledge of the risk which he is assuming. He does not contribute to, nor is he knowingly a party to the results. I believe occupational diseases can be controlled and prevented generally with greater certainty than the control and prevention of accidents. . . . Any legislation in an approach to a solution of the occupational disease problem should contemplate special legislation for prevention along with special legislation for compensation. All statutes which may now be in force for protection of health, and which may be obsolete in the light of recent developments should be repealed. In order to be just and efficient and to comply with constitutional requirements all preventive legislation should be specific, definite and certain. Legislative powers should not be improperly and illegally delegated. . . .

* THOMAS N. BARTLETT, Manager Claim Division, Maryland Casualty Company, at Insurance Section, American Bar Association, Boston, August 26, 1936; quoted in *Bulletin of the Association of Casualty & Surety Executives*, December, 1936.

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Industrial Nursing Pays

"INDUSTRIAL nursing pays dividends to everyone in the organization from the employer to the last man!" A panel discussion* at the industrial nursing session of the 25th National Safety Congress in Atlantic City, New Jersey, was opened with this challenge by Hortense Gruber, chairman of the N.O. P.H.N. Industrial Nursing Section.

Miss Gruber said that the topic, "Industrial Nursing Pays," was chosen in the belief that it would interest not only nurses but also the other members of industrial organizations who are particularly concerned with the health of employees. That the subject is of general interest was evidenced by the fact that nearly one third of the 85 or more people who attended were industrial physicians, safety engineers, personnel directors or employers. Doubtless, the names of well known people appearing on the program as contributors to the panel also formed a reason for attendance. Industrial nurses were particularly pleased that Dr. C. H. Watson, President of the National Safety Council, chose to attend this particular session among the many group meetings held during the morning.

Julia Weder, industrial nurse with the Giant Portland Cement Company in Egypt, Pennsylvania, acted as chairman of the panel and introduced the other members of the audience. The members of the panel represented the various groups in industry, particularly concerned with health and safety.

Panel Participants

DISCUSSION Leader, Julia Weder, R.N., Giant Portland Cement Co., Egypt, Pennsylvania.

Industrial Physician: Dr. Loyal A. Shoudy, Chief Surgeon, Bethlehem Steel Co., Bethlehem, Pennsylvania.

Industrial Executive: Charles H. Edgar, Otis Elevator Company, Yonkers, New York.

Personnel Director: Cyrus S. Ching, Director of Industrial and Public Relations, U. S. Rubber Products, Inc., New York, N. Y. (Listed on program but unable to be present.)

Insurance Executive: David S. Beyer, Vice President and Chief Engineer, Liberty Mutual Insurance Co., Boston, Massachusetts.

Industrial Employee: Charles Zeitler, Industrial Service Department, Oxweld Acetylene Co., Newark, New Jersey.

Industrial Nurse: Marion Dowling, R.N., Lowe Paper Co., Ridgefield, New Jersey.

Miss Weder stated that the value of nursing in industry depends upon two factors: First, an understanding on the part of management as to what may be expected from the industrial nurse, and second, the employment of well qualified nurses. She asked each panel member to speak briefly concerning these factors from the point of view of his particular place in industry. Miss Weder introduced Dr. Loyal Shoudy as the first speaker because "when in trouble, we nurses always call the doctor first."

DR. SHOUDY: Concerning industrial nursing as viewed from the doctor's standpoint, let us touch a few of the high lights. Let us take for

* A digest of the panel discussion at the industrial nursing session held in cooperation with the National Organization for Public Health Nursing at the National Safety Congress, Atlantic City, New Jersey, October 7, 1936; published in *Public Health Nursing*, January, 1937, which notes: "The quotations from the panel are made possible through the generosity of the National Safety Council in providing a stenotypist. The panel was condensed into form for publication by Ruth Houlton, R.N., Associate Director of the National Organization for Public Health Nursing. The panel is published simultaneously in the Transactions of the National Safety Council."

granted first that any nurse who wants to do industrial work must be a graduate of a "class A" nursing school and have a desire to do this work. Let us take for granted also her outstanding interest in her fellow men, and her willingness to work among all classes of people and to do a good job. She must join the doctor in the department that I like to call the department of human engineering.

If she is connected with a plant where there is a full time medical man, the nurse must be able to carry on in the way he plans the work. If she is in a smaller plant where she is the "kingpin" in the medical department and the doctor comes only occasionally, her responsibility is greater. Remember I said she must have the proper training to begin with. After that, ability to show kindness and consideration for everyone who has been injured, everyone who is sick, ability to handle them properly, to build up good will between herself and the personnel of the plant or shop—well, I just can't tell you what I think that is worth. Another thing we want to see in a nurse who is handling a job mainly by herself, is executive ability. One of the hard things to find, not only in nurses but also in doctors and everyone else, is ability to fit oneself in. As the head of a department, she should be able to fit in with the other departments. Sometimes in a small plant she must do two or three jobs, help the superintendent and the supervisors, be part of the employment management, and do part of what in the large plant is the physician's job. She must have executive ability to fit in with these other parts of the plant. Another thing that nurses still have to do in many plants is to sell their services to those in charge and at the same time not to oversell them. You will ask me, "Where is one to find the nurse with all these qualifications?" I don't know. Too many times the nurse is chosen because she happens to have been the nurse for the family of the employer or she happens to be the nurse who took care of the employer himself when he was in the hospital last fall. She is selected purely because she is a good special duty or a good hospital nurse. However, all good hospital nurses do not make good industrial nurses and all nurses who can serve well in the sick room at home, cannot go into industry and make good industrial nurses. An industrial viewpoint is necessary, and how can it be secured? You who have been pioneers in the job have been fortunate enough to pick it up and have it drilled into you. Problems have hit you and you took a look and did what seemed necessary. We talk in this panel of industrial nurses needing courses in public health nursing. There are courses in social work but every good public health nurse is not necessarily a good industrial nurse. I can not assume that because a nurse has made a success of social work she is going to be a good industrial nurse. Sometimes this means she has the habit of prying into things that are none of her business.

CHAIRMAN WEDER: I am sure that is a challenge. Remember that. When we throw this open for discussion, I am sure that you are going to find fault with it! We are now going to hear the industrial execu-

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1937 Annual Meeting, Jacksonville, Florida.

tive's viewpoint from Mr. C. H. Edgar.

MR. EDGAR: In my opinion it is needless to state that an industrial nurse should be a registered nurse, thoroughly experienced in the profession, with good personality and selected with the aid of the industrial physician (whether full time or part time). In addition to this, I feel that the same searching analysis and care should be followed in engaging an industrial nurse as would be given to employing any other employee in a highly responsible technical or professional field, whether the individual is to be trained as an ultimate subexecutive or used for the immediate assignment only. The industry that feels the need for developing industrial nursing is the one which appreciates the waste caused by human inefficiencies and wants this waste reduced to a minimum. The employer, however, cannot be expected to know the complete application of medical and nursing knowledge. The employer does know that he is creating another division and thus adding to the combination of departments already established. He knows that its scope and development must be handled on an economical and business basis. Its growth and justification will depend upon the service it can render beyond that of a mere first aid station. Management will demand that this division be equipped and started properly. It will approve and authorize its policies, but it will not interfere with minute details or attempt to govern its operations. This means that the employer must seek an applicant well equipped with a diversified and extensive nursing experience. In addition to cooperation with the physician in charge, the employer will look to the nurse for the same constructive suggestions, constant progress and improvement as is expected from any other department head. An industrial nurse should not be employed with the thought that she is merely an assistant to the industrial physician, but instead that she should be a wide-awake, alert subexecutive working in full cooperation with the organization as a whole. Her interests are those of management as they reach into the fields of employment, safety, health and welfare. Her interests and relationships likewise should extend beyond the plant, and reach into social, health and welfare organizations of the community. The importance of an industrial nurse cannot be overemphasized. She has a twofold task, and must represent both the viewpoint of the employer and the interest of the employee. A successful industrial nurse is not one who confines her work to nursing only. She must stand out as a leader in accident and illness prevention. She should be prepared to aid and advise wherever health and family welfare are involved. The extent of her services may vary in different types and sizes of business or industry. But whatever the conditions are, she has closer personal contact with a greater number of individuals within the organization than any other worker. Her task, therefore, requires not only education but initiative in developing and expanding undertakings for a healthier and safer place to work, and a healthier and happier group of employees.

CHAIRMAN WEDER: Thank you, Mr. Edgar. We are going on now with our program. Mr. Beyer is Vice-President and Chief Engineer of the Liberty Mutual Insurance Company of Boston. He will talk to us from the point of view of the insurance company.

MR. BEYER: This morning I was talking with a nurse who has spent considerable time in selling the idea of industrial nursing by visiting different plants and talking with the executives. She said she knew all the reasons why industrial nurses should be employed and I told her that this reminded me of a story. There were a couple of men arguing and having a very heated discussion. I finally heard one say to the other, "Well, there is only one side to this question." And then he added as an afterthought, "Anyway, if there is another side, I don't want to hear it." That is about the way I feel about industrial nursing. I always felt that there could be only one side to the question of whether or not it is desirable and pays dividends. I might cite two or three reasons for that belief. When we established the first schedule rating system about 25 years ago, we put in an item of 5% direct reduction in all compensation insurance premiums where there was adequate nursing service in plant hospitals. That is one way in which industrial nursing has been recognized for many years by engineers as paying a very direct dividend. With the schedule rating service, the benefit is still there for the employer who is broad-minded and intelligent enough to use the nurse in the plant hospital. From an insurance standpoint industrial nursing certainly pays by cutting down lost time. This is true even with such minor illnesses as colds. There are many minor treatments which if given at a plant hospital will reduce lost time. This will mean continuity, increased production and saving by preventing minor injuries from develop-

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INDUSTRIAL MEDICINE
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ing into major ones. One of the first fatalities our company had to deal with was that of a janitor who when taking an ash can out one morning cut or bruised his ankle. He received no attention and died of blood poisoning. Every time we see one of these injuries neglected we realize what might have been done by proper treatment on the part of a nurse in the beginning. From the standpoint of the safety engineer I believe the greatest help we can get is through the constructive assistance of a nurse. Accident frequency is a symptom to the engineer just as the temperature of a patient is a symptom to the doctor. The nurse who follows up an accident can often find the causes and give the engineers the significant little details. I could tell you of many interesting cases that have come under my personal observation where nurses have given the safety engineer the greatest assistance in solving problems. There is one more point I want to make. I have a list here of about a hundred concerns that have had anywhere from two hundred thousand to eight million man-hours without a lost time accident. The record of eight million man-hours without an accident was made by a large New England concern that has a foundry. This would be equivalent to a hundred-man plant going for 40 years without a lost time accident. After I looked over the list and had given some thought to this matter, I noticed that the majority of the larger plants with low accident rates have industrial nurses.

CHAIRMAN WEDER: Mr. Charles Zeitler will present to us the point of view of the industrial employee.

MR. ZEITLER: The three previous speakers have covered the question quite thoroughly from top to bottom. There are just two or three words to say, and they are that a good industrial nursing job does pay dividends both to the employer and to the employee. It seems to me that the industrial nurse plays a very important part through the motherly advice which she often gives to the employee. It creates a feeling of good fellowship between the employee and the employer. We feel that she is a necessity in industry.

CHAIRMAN WEDER: Last but not least, we will hear from the industrial nurse herself. Miss Marion Dowling of the Lowe Paper Company, Ridgefield, New Jersey, and the secretary of the Industrial Nurses' Club of New Jersey, will speak for the industrial nurse.

MISS DOWLING: Industrial nursing does pay dividends to the nurse, the employer and the employee. The chief concern of industry is production, and production proceeds most smoothly and efficiently when the workers are happy and well. Nurses who have the proper training and temperament and are willing to work to bring about these particular conditions in an industry are invaluable. To illustrate, I might tell you this incident: Not long ago one of our men had his only son in the hospital to have his tonsils out. To doctors and nurses that doesn't sound very bad but to a lay person it is very serious. The father was doing a particular piece of work that day and underneath he was bothered about his child in the hospital. I went to the hospital to see the boy and when I came back I could report, "I have seen Junior. He is out of ether, his pulse is good and the nurses say that he is a good boy." He said "Whew! What that means to me, you will never know!" He then went on about the job which he had to do and did it in fine style, having been relieved about his youngster.

The Industrial Doctor
OFFICIAL SECTION OF THE NEW YORK STATE SOCIETY OF INDUSTRIAL MEDICINE

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1937 Annual Meeting, Corning, New York.

Discussion

AFTER each of the members of the panel had spoken, the meeting was thrown open to the entire group for discussion which centered chiefly about two subjects:

1. Desirable qualifications and preparation for nurses in industry.
2. Standing orders.

Space does not permit inclusion of all this discussion. Preparation of the industrial nurse through a public health nursing course was championed by Miss Dowling. She said, "Whether the people we care for are 50 or 50,000, they are still a part of the 'public.' I think that a public health background is very important to the nurse in industry. Public health nurses are prepared to teach, and I think that they know when to mind their own business. I am sure they know when a matter is the public's business."

Dr. Shoudy replied that a public health nursing course "certainly should not handicap" the industrial nurse. "The more she has to give out, the better. I merely said that to understand relationships and fit your program into the whole industrial set-up without overstepping is difficult." Dr. Shoudy again stated his feeling that ability to get on with all sorts of people is essential for the nurse in industry, more than for any other type of nurse.

In the discussion of qualifications for industrial nurses several nurses called attention to the fact that many so-called nurses in industry are not graduate nurses. These attendants sometimes attempt to do things which no registered nurse would venture to undertake, and hence may be a menace to the health of employees.

Discussion concerning standing orders brought out the following points, contributed by Dr. Watson, Dr. W. J. McConnell of the Metropolital Life Insurance Company and others.

1. Standing orders are necessary for the industrial nurse since medical

supervision is not always immediately available.

2. Standing orders are useful when the physician is present as they save time in repeating routine instructions.

3. The giving of medicine either by the physician or the nurse is becoming less common in industry. Instead, the employee is referred to his family physician.

4. When standing orders do cover the giving of simple drugs, they must be so worded that the nurse gives the drug on the basis of certain symptoms she observes. She must not be put in the position of making diagnoses.

5. Standing orders usually cover first aid treatment for burns, abrasions and other minor injuries. They include instruction as to the type of solutions to use under various conditions. Often, too, they state certain things which should not be done by the nurse. For example, some standing orders permit the nurse to use a soft cotton wad in attempting to remove foreign bodies from the eye but state that no other instrument should be used.

6. Carefully thought out, conservative and frequently revised standing orders protect the physician, the nurse and the patient.

Dr. Shoudy completed the discussion concerning standing orders by pointing out that all work of the medical department in industry should be conducted in strict accordance with the laws of the state and also in accordance with the highest ethical standards.

Miss Weder next called upon Mr. Graham Cole, Safety Director with the Metropolitan Life Insurance Company.

MR. COLE: (Quoted in part). This has been a most interesting discussion and I was particularly gratified to note the extreme interest that has been displayed in the entire problem by the people who are on the program. In addition, it is indicative of interest that Dr. Watson, President of the National Safety Council, which is responsible for this conference, is with us and has taken part in the discussion. I am sure that every sectional meeting on the board walk today would be very grateful to have Dr. Watson with them but he is here with us. I view industrial nursing from the safety engineer's standpoint. I happened to have received my baptism in safety work in the same company that Dr. Shoudy is connected with and I know the value of the nurse from that angle. When we consider qualifications of nurses I immediately think of the qualifications I would like to see in the nurse who would fit in effectively with what I want to accomplish, namely the prevention of accidents. You, the nurse, attend the injured employees under the doctor's instructions and standing orders, if you will. (I thought that "standing orders" applied to the army, but I have learned something this morning). You receive the employee, frequently after I, the safety engineer, have failed in preventing him from getting into difficulty. You and the doctor are the people that I am then depending upon to keep that case from becoming serious and raising my severity rate. I am going to be just as frank as Dr. Shoudy was when he started this discussion. I have met two types of nurses in industrial plants. One type of nurse has a job and is interested only in keeping it. She thinks her job is merely to carry out the orders of the doctor and to give proper treatment. Fortunately all nurses in industry are not of this type. I find the other type of nurse too. I will not attempt to classify her in technical terms. She is a nurse who believes that she has an important part to play in the industrial organization, and she has not erred. Dr. Shoudy warned you against trying to put your nose into the other fellow's business. However, you do not err when you try to point out unsafe plant conditions which have come to your attention. Instead, you will have found your niche in that organization and become an influencing factor in that company. I will say that when I have found this type of nurse, I have found an industrial plant more and more sold to the value of the nurse. I have found nurses who have become invaluable to the organization. They have built themselves into their organizations. Twenty years ago in industrial work, a safety engineer was frequently looked upon as a necessary nuisance. The industrial nurse does not wish to be so classified. It is necessary that she build herself into the organization. Her position is indispensable in industry, but the employer does not yet know that in every case.

DR. SHOUDY: How is the nurse going to help the safety engineer?

MR. COLE: The industrial safety engineers are interested in the prevention of accidents. To my mind, the industrial nurse is in a splendid position to assist and to advise them. The nurse receives the employee at the time when he is most susceptible to education for prevention of accidents. Maybe I have been talking to some man for months on safety. Perhaps he has said, "That's fine, Cole, you have a lot of good suggestions, but I have never been hurt." When this fellow has had an accident and comes to the dispensary, however, he listens. The most effective time is right after he has been injured and when he is seeking help. You are the "White Angel," so to speak. Then you are in a position to help him and he is susceptible to education. You can talk to him about the cause of the accident and he will tell you things he won't tell two hours afterwards. You have a splendid opportunity to help the safety engineer by assisting him in finding out the dangerous situations in the plants which come to your attention through accidents.

DR. SHOUDY: In order for a nurse to give you that information, is it not important that she should know her industry?

MR. COLE: There is one other phase of the problem that I am interested in as a safety engineer and with which I think the nurse can help. We feel there is a more or less definite correlation between the occurrence of an accident and the physical condition of the human being. Where should we go to get the definite information? You people are in close daily touch with the employees in your organization. I would like to see the industrial nurse give some attention to the relationship between accident and the physical condition of human beings who are injured. The nurse meets employees coming in for treatment. If she will watch them she can see if there is a continued recurrence of ill health. If the man is coming in every two or three days asking for aspirin tablets, that indicates something may be wrong with his general condition. The nurse should watch those cases. If she finds there is an undue proportion of such individuals who eventually come in to have a finger tied up, we want to know about that relationship. Now if I am to expect all that from you, what should I do to help you in carrying out these responsibilities? You can't report on conditions in a plant if you have never seen them. You can't tell me about things that I want to know unless you have some idea of what I want to know. You meet employees in the dispensary. Should I, as a plant engineer take you

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out into the plant? Should I provide an opportunity for you to see at first hand the situations under which the employees are meeting accidents? To what extent should I, as a safety engineer, assist you, the industrial nurse, in gaining the kind of information you want, and what is that information? Will someone give me an answer?

MISS DOWLING: I should like to say that the industrial nurse need not wait to be taken to the site of the accident but might go of her own accord to investigate the matter. Of course, this will depend upon the size of the plant and whether a safety engineer is employed.

H. N. WELCH (Bloomfield, New Jersey): I might offer a comment. I have the safety and personnel work in our company and the nurse is one of my very valuable co-workers. I find that it is quite frequently of importance to go with her, after a minor or more serious accident, to the scene of the accident and let her get the exact picture. She will be able then in subsequent accidents to know the conditions under which the employee works. I think that the safety management must cooperate with the nurse and give his knowledge of the plant conditions to her in the same manner that he expects her to keep him posted.

CHAIRMAN WEDER: May I ask, does your nurse function as a member of the safety committee?

MR. WELCH: Indirectly. In some cases she has been a bona fide member of the safety committee.

NEVADA M. EVANS (Philadelphia, Pennsylvania): Miss Weder, should an industrial nurse attend safety meetings?

CHAIRMAN WEDER: Will you answer that, Mr. Cole?

MR. COLE: I think that is a difficult question to anwer generally, as it depends on operation and the type of activities conducted. There are certain conditions where it would not be best and there are others where it would be highly desirable.

CHAIRMAN WEDER: Don't you think the nurse offers a valuable contribution to the safety work just by her attitude when an injured man comes into the first aid room? I have seen nurses who, when a man comes in with a little cut, give little attention to it. But if a nurse is cordial and shows the man that she is concerned over the small things, it seems to me she makes a contribution to the safety work.

MR. COLE: That is most important in industry. There is one other thing I want to say; namely, that there is need for the nurse to have a proper relationship with the supervisory force. I can't imagine a qualified nurse in an industrial plant hesitating to go around the industrial plant. If she has developed the right kind of relationship with the supervisory force and they are sold on her work, they will provide opportunity and give her time.

(A number of interesting contributions from nurses as to things they are doing in their respective industrial plants are omitted here for lack of space).

CHAIRMAN WEDER: There are other things in addition to first aid that the nurse does. What about the help the nurse gives in the home

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problems of employees? Many industrial nurses do go into the homes. Even if there weren't any safety department or medical department there would still be need for the nurses who have had public health training. When called into the family to give bedside nursing or other help, they look into the medical and social problems of the family and help solve them. I am sorry that our time is so limited. There are many things that we could discuss here. However, I am going to ask Miss Joanna M. Johnson to make a summary of the discussion now.

JOANNA JOHNSON (Employers Mutual Insurance Company, Chicago): It is certainly wonderful to have so many here who are taking an active interest in our group. I don't think that we have used our doctors and safety engineers enough. There is one point that we haven't touched on and one that I think we should mention; namely, the following up of the physical examination. In large plants this is done by the doctor who gives full time to the work. That isn't true in the smaller plants. Physical examinations, if properly followed up, will fit the man for the job. The doctors in industry don't take care of these cases; they can't. But employees can be referred to the family doctor. There is no use for the man to know about his defects unless he does something about them. We, as nurses, can encourage these men to have their defects followed up. Some of you may have stenographers to do your records, but most of us do not. We are in small plants and we must do these things ourselves. If you make up a card file, defects can be easily kept track of. One of the nurses has tried a clever method at the Beloit Iron Works. She has a little red clip placed on the card for a heart case, perhaps a blue clip for bad teeth, a yellow clip for poor vision, and so forth. At that particular plant about 95% of the poor vision cases have been corrected; dental work has been done on practically all cases having need of it. There are several diabetic patients who are under treatment also. To me this is one of the most important contributions that industrial nurses can make and it creates a demand also for the services of doctors in the communities. I think Dr. Shoudy brought out beautifully the importance of creating good will. If we aren't interested in creating good will, if we aren't anxious to serve, then we aren't true industrial nurses. Insurance rates were mentioned and since I am representing an insurance company, naturally I am interested in rates. All of us should be. If the insurance companies would continue to make it a practice to give a decrease in insurance rates because of nursing service, I think it would help to get a great many more nurses in industry. I don't think that 5% is enough. I think it should be 10%. Standing orders are a fine thing. This has been a problem for most of us in industry. I think we need standing orders. Just how they are to be arranged, must be worked out with the doctor and the nurse in each industry. The Wisconsin State Medical Society has issued a pamphlet containing standing orders. The list is simple. It is brought to the individual plant physician and is left at the plant. This makes us feel that we are working with the medical society and that they appreciate the power for good that we have. Then as to the duty of the nurse as an educator. This was brought out by the employer, and I think, by the employee. The influence that she has in safety work is vastly important. She sees the man at the time that he is most interested in the injury he has received. At that time she can help the safety man most by encouraging employees to report promptly. There are a hundred other things that were not brought up that I think nurses are doing. The nurse going through the plant has a definite influence in creating a better place for the men to work. She does that by making comments as to the plant housekeeping, good paint, and other things. The men will try to make the place look better when she comes again. I know one plant this spring that spent $1,000 on paint because we brought up the idea of good housekeeping in one of our meetings and asked the foreman to dispose of rubbish. Our chief problem at the present time is, I believe, that of educating the employers as to what the industrial nurse can do. I know dozens of plants in which the employers should be convinced of the value of industrial nursing.

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Injection Treatment of Hernia

THERE has been little scientific investigation into the ultimate value and potential dangers of the injection treatment of hernia.* It seems strange that this is true despite the numerous articles and reports, some of which date back to the early part of the nineteenth century, while recent workers are obviously not fashioning any new principles. Unlike the earlier solutions which were too caustic, recent preparations are relatively non-irritating and incite no systemic reactions.

Some helpful experimental work has been done in the Departments of Surgery and Pathology at Mount Zion Hospital, San Francisco. Drs. H. Brunn and G. Y. Rusk observed the effect of such irritating substances as alcoholic solutions of tannic acid, and a 5% sodium salt of fatty acids from oil of psyllium, upon muscular tissue of animals. The reaction was virtually the same in each instance: In six hours, they saw marked poly-

* Editorial in *Colorado Medicine*, January, 1937.

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morphonuclear infiltration and interstitial edema; the muscle fibers had lost some of their detail. In 24 hours the picture was essentially an exaggeration of this early response. At the end of seven days there was a very marked inflammatory reaction and some new fibrous tissue formation. After 14 days there was more fibrosis and noticeable edema. Within 10 weeks the fibrous tissue had become arranged in compact bands.

It may be inferred from the time required for fibrous tissue formation, that a most important requisite during treatment, and for several months following, is continuous apposition of tissues by pressure with a truss. Certain contra-indications to this type of treatment are obvious. Among others are incarcerated hernia, hydrocele of the cord, and any condition causing straining (chronic cough, prostatic hypertrophy, urethral stricture). Usually umbilical, femoral, and incisional ruptures are unsuited to this conservative therapy. Certain theoretical dangers are said actually not to exist. After an adequate course of treatment, it is hoped that there is a welding of the tissues which were separated by the bowel, namely the internal and external oblique muscles and the transversalis fascia. It is claimed that the sac, though of course not removed, ultimately becomes a fibrous cord.

Out of 190 cases reported at the Southern Pacific General Hospital, one failure was later treated surgically, and eighteen needed further injections. From the Mount Zion Hospital, San Francisco, no untoward complications (testicular atrophy, impotence, death) are noted in 165 cases; there were 4% recurrences in young patients and 22% in old and "poor risk" cases. One might conclude that the procedure is suitable where surgery is contra-indicated. But it still should be done by a surgeon and granted the respect of a surgical procedure.

Appointments

IRVING S. CUTTER, M.D., since 1925, Dean of Northwestern University Medical School, and, since 1934, Health Editor of Chicago Tribune, has been appointed Medical Director of the Chicago & North Western Railway. Dr. Cutter was born at Keene, New Hampshire, December 5, 1875. He was Instructor in the high school at Beatrice, Nebraska, 1896; Principal, 1898-1900; and general agent for Ginn & Company, 1900-1906. At the University of Nebraska, he was Sc.B. in 1898; M.D. in 1910; Instructor in Chemistry from 1910 to 1913; Professor of Biochemistry and Director of Laboratories from 1913 to 1915; Dean of the College of Medicine, from 1915 to 1925. The University of Nebraska made him Hon. D.Sc. in 1925; Jefferson College, LL.D. in 1931. On July 1, 1925, he was appointed Associate Professor of Medicine, and Dean, at Northwestern University Medical School; in 1928, Medical Director at Passavant Memorial Hospital; and on June 17, 1934, Health Editor of Chicago Tribune. He was Captain, U.S. Medical Corps, 1918-1919; Lieutenant Colonel, Medical Section, O.R.C., 1920-1929. He is a Trustee of Northwestern University, and of Wesley Memorial Hospital; a Fellow of the American Association for Advancement of Science, and of the A.M.A.; a member of the American Chemical Society; the Association of American Medical Colleges, of which he was President, 1923-24, and Chairman of the Executive Council; Sons of the American Revolution; and of fraternities: Alpha Omega Alpha, Sigma Xi, and Phi Rho Sigma, having been President of the latter. He edited the Nebraska State Medical Journal, 1916-1918. His writings include: "Laboratory Manual of High School Botany," (with F. E. Clements), 1899; "The School of Medicine," 1930; "History of Physical Therapy," 1932; "History of Obstetrics and Gynecology," 1933, and numerous monographs on medical and educational subjects. In his new position, Dr. Cutter will continue his identifications with Northwestern University Medical School, Chicago Tribune, and Passavant Hospital.

VICTOR H. HORNING, M.D., has been named Assistant to Dr. Irving S. Cutter, in his new position as Medical Director of the Chicago & North Western Railway. Dr. Horning was born in 1882, and graduated M.D., at Bennett Medical College, Chicago, in 1912. He is a Fellow of the A.M.A.; and a Vice-President of the American Association of Railway Surgeons.

STATE Industrial Commissioner Elmer F. Andrews has announced the appointments of Dr. Edgar Mayer of Saranac Lake and New York City, and Dr. J. Burns Amberson, Jr., of New York City, as "expert consultants on dust diseases to the State Department of Labor.

The positions are in the exempt class of the civil service and were created by the 1936 legislation providing for the prevention of silicosis and other industrial dust diseases and the elimination of dust disease hazards in New York State industries. The law provides that the Industrial Commissioner shall appoint to these positions "physicians in good professional standing, each of whom shall have had, at the time of his appointment, and immediately prior thereto, at least 10 years of practice in the diagnosis, care and treatment of diseases of the pulmonary tract, along with the interpretation of x-ray films thereof."

Doctor Mayer also was recently appointed medical director of the project for the study of silicosis at the Cornell Medical College and the New York Hospital, sponsored by the New York City Department of Health and the New York Tuberculosis Association. Doctor Mayer is consultant attending physician at the New York and Bellevue hospitals; consultant physician of Otisville (Otisville, N. Y.) and Loomis (Liberty, N. Y.) Sanatoria, to the Broad Street Hospital, New York City, and to the Preventorium of Tuberculosis, Farmingdale, N. J., and consultant on radiation of the Council of Physical Therapy of the American Medical Association. He is also assistant professor of clinical medicine at Cornell Medical College.

Doctor Amberson is professor of clinical medicine, College of Physicians and Surgeons, Columbia University; assistant professor of clinical medicine, New York University College of Medicine; visiting physician, tuberculosis service, Bellevue Hospital; consulting physician, Loomis Sanatorium; attending physician, New York State Tuberculosis Hospitals; member of Medical Research Committee, National Tuberculosis Association and New York Tuberculosis Association; president of the Association of Tuberculosis Clinics. Doctor Amberson received his Ph. B. at Lafayette College in 1913 and his M. D., at Johns Hopkins Medical School in 1917. He was licensed to practice in New York State in 1918. He has served as consulting physician, Department of Health, New York City; physician-in-chief, Loomis Sanatorium, and consulting physician, Bellevue-Yorkville Health Demonstration.

PHILIP H. KREUSCHER, M.D., F.A.C.S., has been appointed Chief Surgeon for the Chicago District of Carnegie-Illinois Steel Corporation, succeeding Dr. Geo. G. Davis, resigned to go into private practice. Dr. Kreuscher was born at De Witt, Nebraska, November 18, 1883. He was graduated M.D. at Northwestern University Medical School in 1909; was Instructor in Surgery there from 1915 to 1919, and has been Associate Professor of Surgery there since 1932. He is Attending Surgeon at Passavant Memorial and Wesley Memorial Hospitals, Attending Orthopedic Surgeon at Cook County Hospital, and Consulting Surgeon for the Veterans' Hospital at Hines, Illinois. In the American College of Surgeons, he is a member of the Committee on Fractures, and a member of the Committee on Industrial Medicine and Traumatic Surgery. He is a Fellow of the A.M.A.; a past President of the Illinois Medical Society; and a member of Chicago Medical Society, Chicago Surgical Society, Chicago Pathological Society, Clinical Orthopaedic Society, Chicago Orthopaedic Society, American Academy of Orthopaedic Surgeons, and Institute of Traumatic Surgery. He is a member of the Editorial Board of Surgery, Gynecology & Obstetrics; and the author of numerous articles on bone and joint surgery. For a number of years he has been Medical Director of the Industrial Commission of Illinois.

Deaths

FRANK EDWARD SCHUBMEHL, M. D., Medical Director of the Lynn plants and the Everett Works of the General Electric Company since 1913, died at Deaconess Hospital, Boston, January 5, 1937. Dr. Schubmehl was born at Dansville, N. Y., January 10, 1867. He was graduated M.D. at Boston University School of Medicine in 1898, and engaged in private practice in Boston until 1912, when he became interested in industrial medicine. The following year he began his identification with General Electric, at Lynn, Massachusetts. Under his direction the medical services at the plants there were developed and enlarged, and his interest in the preventive as well as the curative phases of industrial medicine was manifested in the high quality and broad scope of the health measures he inaugurated and maintained. He was a Fellow of the A.M.A.; and a member of the Massachusetts Medical Society, and the Massachusetts Society of Examining Physicians and Surgeons. His special interests, however, were with the Conference Board of Physicians in Industry, the New England Conference of Industrial Physicians, and the American Association of Industrial Physicians and Surgeons; he was active in the work of these organizations. He also belonged to various Masonic orders, and to Phi Chi medical fraternity. In the wide circle of his personal contacts he was admired for his personal qualities. In the wider circle of his field of work in industrial medicine, he will be remembered and respected for the quality of his contributions to its progress.

FRANCIS DENNIS DONOGHUE, M.D., recognized as an authority on cancer, tuberculosis, and industrial accidents, died at Boston on January 4, 1937. Dr. Donoghue was Medical Adviser for the Massachusetts Department of Industrial Accidents. He was born in 1871; graduated M.D. at Harvard University Medical School in 1894. By Presidential appointment he was a delegate to the International Conference on Industrial Accidents and Diseases at Amsterdam in 1925, and, subsequently, the VI Conference, at Geneva, in 1931, and the VII Conference, at Brussels, in 1935.

Licensed in New York

IT IS understood that in the forthcoming issue of the "Medical Directory of New York, New Jersey, and Connecticut," an additional entry will appear after the names of physicians who have been authorized to render medical treatment and care under the Workmen's Compensation Law.* These entries will be made by the Committee on Workmen's Compensation of the Medical Society of the State of New York from their records, which are duplicates of the records at the Industrial Commissioner's office, and not by the individual physician. This additional information will be added to the data as forwarded by the physician on the card he received from the State Society for inclusion in the Directory.

Body and Skin Temperatures

LEEDS & NORTHRUP CO., 4934 Stenton Avenue, Philadelphia, Penna., have just published Bulletin No. 423-A, describing methods for measuring and recording skin temperatures. An excerpt reads as follows:

"This equipment supplies the physician with temperature readings in various forms which are not available when mercury thermometers are used. Apparatus consists of a small temperature-sensitive unit connected to a measuring or recording instrument. Sensitive units are suitable not only for sublingual and rectal temperatures, but also for accurate measurements of axillia, skin surface and subcutaneous temperatures. With such equipment, a patient's temperature may be indicated on the dial of a portable instrument, or recorded continuously and automatically on a chart." A copy will be sent upon request.

News

THE National Silicosis Conference first met in Washington on April 14, 1936, under the sponsorship of the Department of Labor. Following the meeting, four technical committees were appointed by Frances Perkins, Secretary of Labor, to study and report upon various phases of the problem of silicosis in industry. Numerous meetings have been held by these committees and extensive analyses have been made. Having completed their work in so far as is possible under present conditions, these four committees presented their reports and recommendations at a Second National Conference held on Wednesday, February 3.

CAREY P. McCORD, M.D., Medical Director, Industrial Health Conservancy Laboratories, Detroit, has just returned from a fairly extended trip in Honduras and other Central American countries, studying occupational diseases.

DISCHARGED pottery worker Sam. N. White, Robinson, Ill., wrote the Secretary of Labor, that he and 30 associates were dismissed by W. A. Case & Son, Robinson pottery manufacturers, the day before the new Illinois Occupational Diseases Act became effective. "It appears that at the instance of the insurance carrier," Miss Perkins wrote to Gov. Horner, "the employees were given a physical examination and those

* *Bulletin of the Medical Society of the County of Kings*, October, 1936.

found to have any indication of silicosis were summarily dismissed despite the fact they had been employed by the pottery concern for 10 to 16 years, and also notwithstanding the fact that they were able to continue at their work." (News Comment.)

THE Eighth Annual Convention of the Greater New York Safety Council will be held at the Astor Hotel, New York City, on April 13, 14 and 15. A program of approximately 40 sessions covering every phase of accident prevention work has been developed for the benefit of the 7,000 who are expected to attend. The Schedule of Sessions includes—April 13: Reaching the Foreman; Street and Highway; Illness of Workers; Reaching the Worker; Home Safety; Accident Prevention Equipment; Hotels; Mercantile; Safety Council Managers —April 14: Occupational Diseases; Safety Belts; Fire Prevention; Construction; Petroleum; Dust Control; First Aid; Commercial Vehicles; High School Safety; Aeronautical; Rubber; Marine—April 15: Occupational Disease; The Worker's Eyesight; The Small Plant; Safety Exchange; Rubber; The Child; Industrial Health; Hospitals; Building Operation Maintenance.

THE Division of Life Saving of the Rhode Island Department of Public Health has launched a campaign for better resuscitation methods in Rhode Island, sponsored by Dr. E. A. McLaughlin, Director of Public Health. This past summer Dr. McLaughlin sponsored a relief-manned life guard project, saving 29 persons from drowning, rendering first aid to 1535 persons. It is now proposed to advance resuscitation in Rhode Island, encouraging the establishment of more crews.

JANUARY 1937 marked the initial appearance of the bulletin of the International Association of Industrial Accident Boards and Commissions under the title of the ABC Reporter. The new bulletin will come out quarterly and is the result of the unanimous decision of the Association's executive committee (Topeka 1936 Convention). It aims to supply the need for a more constant interchange of information and news between annual meetings.

Treatment for Frost-Bite

A BULLETIN issued by the safety department of the Works Progress Administration of Indiana, offers this treatment for frost-bite:*

"The experience of many Arctic explorers has demonstrated clearly that rubbing after freezing has taken place, is not the proper treatment. Rubbing with snow is especially bad. The frozen tissues are bruised and torn, and gangrene is very apt to result.

"Gently cover the frozen part with the hand or other body surface until the part is thawed and circulation is re-established. If a hand is frozen, hold next to the skin in the armpit, or between the thighs, or the frozen part may be thawed very gradually in cool air or cold water. If this cannot be done, cover the part with extra clothing until it is thawed. DO NOT expose to hot stove, fire or radiator for some time, as severe pain or even permanent damage may result."

* *O. I. C. Monitor*, January, 1937.

Painters' Hygiene

AMERICAN industrial hygienists have long looked to Dr. Alice Hamilton, for a number of years associated with the Harvard University Medical School and recently on the staff of the United States Department of Labor, for leadership in various phases of this field.* In 1913 Dr. Hamilton prepared a report for the Department of Labor on the hygiene in the painters' trade. Recently she has followed up this earlier study and the report has been published as Bulletin No. 7 of the United States Department of Labor, Division of Labor Standards. Dr. Hamilton points out, among other things, that the painters' trade has always been unhealthful above the average and that the records of industrial insurance companies in this country and of the state sickness insurance bureaus of other countries have shown this very clearly. Changes in the last 20 years have, according to Dr. Hamilton, affected both the materials and the method of work. Changes in materials have resulted in displacement of lead pigments in house painting to a certain extent, especially in interior decoration; and to a far greater extent in the painting of furniture, automobiles, ships, railway cars, tractors, trucks, and so forth. The pigments that have taken the place of lead are, for the most part, entirely harmless.

Concurrently with this displacement of lead has come an equal lessening in the use of turpentine. Paints have been rendered much less poisonous, but paints are not used as much as formerly, cellulose lacquers and synthetic resins having taken their place for many purposes. In these coatings the difficulty lies not in the solid part but in the liquid which is composed of volatile compounds which are more or less poisonous and thinned with other poisonous volatile liquids.

* *Safety Engineering*, January, 1937.

Physical Examinations

"A RECENT examination of the employees of a large baking concern disclosed the fact 11 of the employees produced 4 plus Wassermann results. Another recent examination of some 300 men working in a plant where heavy machinery is manufactured disclosed 51 men suffering from hernia . . ."*

"One large employer in the City of Chicago has been conducting physical exainations of its employees for the past twenty years. Its reports show that, out of a total of 3,488 employees examined in one group, 1,574 were found to be free of defects and 1,914 were found to be defective. Some of these employees had several defects, the total number of which amounted to 3,022 among the 1,914 employees. A fact of great significance is that, of the group examined, 80% of all the defects were found correctible to normal. Of the remaining 20%, 15% were able to be improved to the point they constituted safe workmen and they therefore remained an economic factor in the company. Less than 1% were removed temporarily from work while treatment was instituted. When these were found fit for some kind of work they were placed where their physical handicap would not be a hazard to them."

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OCCUPATIONAL DISEASES

The General Assembly of the State of Illinois has recently passed an Act, covering occupational diseases of Industrial employees. This Act is particularly concerned with diseases of the lungs, and poisoning from certain chemicals.

Under this new law it will be necessary for many industries to examine their present employees, and new employees, to determine their present health status and thereby prevent future liability.

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1. Holmes, Pigott, Sawyer & Comstock—Indust. Med., July 1936.
2. Beard—J. Am. Dietet. A.—10:193 (1934).
3. Gardner & Gardner —Am. J. Dis. Child. 47:1261 (1934).
4. Cameron — J. Am. Dietet. A. 11:189 (1935).

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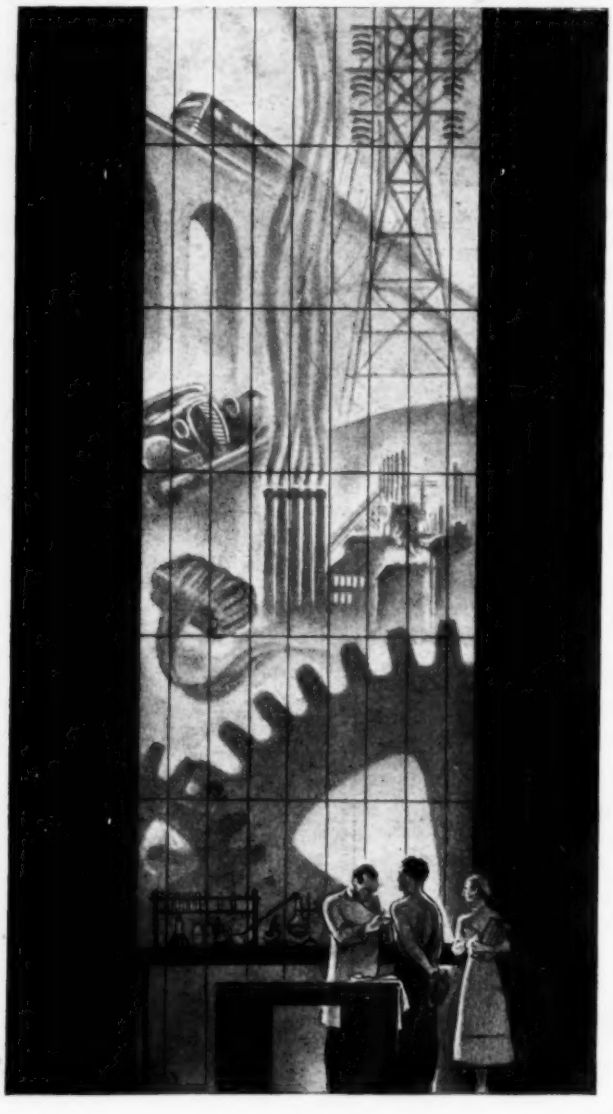

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